WBS Dictionary as of Mon 10/17/05
Run IIb Installation

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5	Run IIb Installation	Tue 1/4/05	Wed 8/9/06	$87,500.00	$0.00	$480,012.80	$567,512.80

Notes

WBS Definition-
This summary task has as its scope the removal of the Run IIa silicon Hdisks and the installation of a new L0 tracker, and the installation of the L1 Calorimeter tracking trigger, the L1 Calorimeter track matching system, upgrades to the Level 2 beta processors, the L2 silicon track trigger upgrade, and the technical commissioning of all the new systems before and after the closing of the detector and the physics commissioning of the upgrades during the restart of the colliding beam program.

1.5.1	Beginning of RunIIb Shutdown	Wed 3/1/06	Wed 3/1/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone-Tevatron shuts down for RunIIb Installation.

1.5.2	Layer 0 Silicon Installation & Technical Commissioning	Tue 1/4/05	Tue 5/30/06	$12,000.00	$0.00	$145,536.80	$157,536.80

Notes

WBS Definition-
This summary task covers the effort to install the L0 silicon tracker for the D0 Run IIb upgrade project. The detector will augment the existing silicon microstrip tracker currently in use for Run IIa, and it assumes the use of the Vicor LV supplies and special adapter cards plus SVX4 readouts for the L0 channels, and it assumes the use of 80-conductor cables for the 300V HV supply.

1.5.2.1	Prepare Silicon Infrastructure	Tue 1/4/05	Mon 9/19/05	$12,000.00	$0.00	$24,362.60	$36,362.60

Notes

WBS Definition-
This summary task includes activities that must take place to ensure that all infrastructure components required for the Run II b silicon (cables, adapter cards, chiller and dry gas systems, transportation and alignment fixtures, temperature monitoring system and HV and LV systems) are in hand prior to shutdown.

1.5.2.1.1	Prepare New HV Power Supply Systems for L0	Tue 1/4/05	Thu 7/21/05	$5,000.00	$0.00	$7,544.00	$12,544.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	25%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	160 h	0 h
37	SeniorElecEngF	25%	$7,544.00	$0.00	$7,544.00	$0.00	160 h	0 h	0 h	160 h	0 h
48	MandS	5,000	$5,000.00	$0.00	$5,000.00	$0.00	5,000		0	5,000	0
55	Linda Bagby	25%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	160 h	0 h
72	John Anderson	25%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	160 h	0 h

Notes

WBS Definition-
This task provides for the development of the high voltage fanouts for the L0 channels -- [1/05 the HV crates, mother boards, pods, and crate PS, are in hand. The pods are tested, the crate PS is tested, the MCH2 rack layout is done, the fanouts are done. The 96 SHV cables for MCH (pod -- fanout) must be purchased.

M&S BOE-
Added HV channels may be required in MCH2, but no additional 50-conductor (MCH -- Platform) nor 34-conductor cables are required. 96 SHV cables are required for MCH2.

Labor BOE-
Two man-months of physicst time and the like for Electrical Engineer are required to complete this task. Lynn Bagby and John Foglesong are the preferred personnel

1.5.2.1.2	Refurbish dry gas system	Thu 6/23/05	Thu 7/7/05	$500.00	$0.00	$1,528.60	$2,028.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	10%	$379.60	$0.00	$379.60	$0.00	8 h	0 h	0 h	8 h	0 h
40	SeniorMechTechF	50%	$1,149.00	$0.00	$1,149.00	$0.00	40 h	0 h	0 h	40 h	0 h
48	MandS	500	$500.00	$0.00	$500.00	$0.00	500		0	500	0
59	Russ Rucinski	10%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	8 h	0 h

Notes

WBS Definition-
This task provides for required periodic maintenance of the dry gas system: change of dessicant in the dryers, and any other needed preventive maintenance .

M&S BOE-
Dessicant and other small items, $500.

Labor BOE-
The estimated labor requirements are based on RunIIA experience with the dry air system. One full time mechanical technician, plus 2w of a mechanical engineer, 2 weeks of an electrical engineer, and 2w of a physicist to guide the task, are required. Contingency is set at 150%. Dan Markley is the preferred electrical engineer, Bill Cooper the preferred physicist, and Russ Rucinski the preferred mechanical engineer.

1.5.2.1.3	Interface L0 Temp Monitoring System to DMACS	Tue 7/5/05	Mon 7/18/05	$6,000.00	$0.00	$760.00	$6,760.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
13	CompProfF	25%	$760.00	$0.00	$570.00	$190.00	20 h	0 h	0 h	15 h	5 h
48	MandS	6,000	$6,000.00	$0.00	$6,000.00	$0.00	6,000		0	4,500	1,500
60	Dan Markely	25%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	15 h	5 h

Notes

WBS Definition-
This task provides for the interfacing of the L0 Temp Mon system to the Cryo Computer Control system: procure AD modules, test modules, insert device names in tables, lay out operator's console screens.

M&S BOE-
NA

Labor BOE-
The estimated labor requirements are based on RunIIA experience, where hundreds of channels of temperature monitoring were interfaced to the DMACS system. Dan Markley is the appropriate computer specialist.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.1.4	Label and Test TempMon Cables	Mon 6/20/05	Tue 6/21/05	$500.00	$0.00	$240.00	$740.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	10%	$0.00	$0.00	$0.00	$0.00	1.6 h	0 h	0 h	0.8 h	0.8 h
38	SeniorElecTechF	50%	$240.00	$0.00	$120.00	$120.00	8 h	0 h	0 h	4 h	4 h
48	MandS	500	$500.00	$0.00	$500.00	$0.00	500		0	250	250
55	Linda Bagby	10%	$0.00	$0.00	$0.00	$0.00	1.6 h	0 h	0 h	0.8 h	0.8 h

Notes

WBS Definition-
This task tests, labels and bundles the temperature monitoring cables for the L0 detector (DMarkley chassis in Platform to horseshoes).

M&S BOE-
$500 for cables

Labor BOE-
Testing, labeling, bundling effort: 16 (8 per end) 22-Ga temperature monitoring cables. Labeling & Testing: Glenair tester permits testing of 1 cable in 5--10 minutes. Labeling and bundling make the task a 2 day's job.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.1.5	Complete L0 Cables, Controller for LV PS for L0	Thu 6/30/05	Thu 7/28/05	$0.00	$0.00	$4,800.00	$4,800.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	20%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	11.2 h	20.8 h
38	SeniorElecTechF	100%	$4,800.00	$0.00	$1,680.00	$3,120.00	160 h	0 h	0 h	56 h	104 h
55	Linda Bagby	20%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	11.2 h	20.8 h

Notes

WBS Definition-
Prepare LV cables and CAN controller software for new LVPS for L0.

M&S BOE-
NA.

Labor BOE-
One man-months of physicst time and the like for Electrical Engineer are required to complete this task. Lynn Bagby and John Foglesong are the preferred personnel.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.1.6	Modify RunIIa L3/Offline Silicon Software -FNAL	Wed 1/5/05	Fri 7/8/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	1,040 h	0 h	0 h	676 h	364 h
89	Shaoua Fu	100%	$0.00	$0.00	$0.00	$0.00	1,040 h	0 h	0 h	676 h	364 h

Notes

WBS Definition-
This task modifies the L3/offline software needed for the L0 silicon system at DAB. Included is simulation(D0gstar), unpacking and calibration, cluster reconstruction, L3 algorithms, track resonstruction(RECO), monitoring (Examine, event display).

M&S BOE-
NA

Labor BOE-
The effort estimates are made by assessing the time needed to make a series of well-defined modifications to the existing Run IIa software. The effort estimates and capable individuals are: simulation 8mw (Chabalina), unpacking and calibration 4 mw (Kulik, Zdrazil), cluster reconstruction 8mw (Barberis, Kulik), L3 algorithms 3mw (Illingworth), track reconstruction 6mw (Kulik, Khanov, Borisov), monitoring 12mw (Chabalina, Hesketh, Dean).

S. Fu (postdoc).

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.1.7	Modify RunIIa L3/Offline Silicon Software - U	Wed 1/5/05	Fri 7/8/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	2,080 h	0 h	0 h	1,352 h	728 h
88	Alexei Melnitchouk	100%	$0.00	$0.00	$0.00	$0.00	1,040 h	0 h	0 h	676 h	364 h

Notes

WBS Definition-
This task modifies the L3/offline software needed for the L0 silicon system at DAB. Included is simulation(D0gstar), unpacking and calibration, cluster reconstruction, L3 algorithms, track resonstruction(RECO), monitoring (Examine, event display).

M&S BOE-
NA

Labor BOE-
The effort estimates are made by assessing the time needed to make a series of well-defined modifications to the existing Run IIa software. The effort estimates and capable individuals are: simulation 8mw (Chabalina), unpacking and calibration 4 mw (Kulik, Zdrazil), cluster reconstruction 8mw (Barberis, Kulik), L3 algorithms 3mw (Illingworth), track reconstruction 6mw (Kulik, Khanov, Borisov), monitoring 12mw (Chabalina, Hesketh, Dean).

Alex Melnitchouk (U. Miss) postdoc, leads; Timwar ? grad student UIC, ?grad student KU

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.1.8	**Prepare Safety and PORC documentation**	**Tue 9/6/05**	**Mon 9/19/05**	**$0.00**	**$0.00**	**$9,490.00**	**$9,490.00**

Notes

WBS Definition-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Prepare Safety and PORC documentation" continued

Notes

This task provides effort the preparation of any required safety documentation (e.g. extended silicon HV and LV systems, Be beampipe handling procedures, etc.) and drafts the necessary PORC's so that only final "walk-thrus" are needed as installation is completed. The task is scheduled to begin somewhat arbitrarily 1 year before the beginning of the shutdown.

HV in 2005?
Beampipe leak check procedures. (Russ to review 2004 SNEG item)

M&S BOS-
None.

Labor BOE-
Ongoing physicist and engineering effort required to assure paperwork completion in a timely maner. Rich Smith, Russ Rucniski, Bill Cooper, Lyn Bagby, Youri Orlov, Dan Marlkey, are the preferred physicsts and engineers to prepare the documentation.

1.5.2.1.8.1 Prepare L0 Si Cooling Safety and PORC Documentation — Tue 9/6/05 — Mon 9/19/05 — $0.00 — $0.00 — $3,796.00 — $3,796.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	10%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	100%	$3,796.00	$0.00	$0.00	$3,796.00	80 h	0 h	0 h	0 h	80 h
58	Bill Cooper	10%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
This task provides effort for the preparation of the Layer Zero Si cooling system safety documentation and PORCS, including "walk-thrus" required for permission to operate the system.

M&S BOS-
None.

Labor BOE-
Based on RunIIa experience and considering that review/updating of existing documentation constitutes the bulk of the task, two weeks time by an mechanical engineer, and supervision by a physicist are required for this task. Bill Cooper and Dan Olis are the preferred personnel.

1.5.2.1.8.2 Prepare L0 Si Dry Gas Safety and PORC Documentation — Tue 9/6/05 — Mon 9/19/05 — $0.00 — $0.00 — $3,796.00 — $3,796.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	10%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	100%	$3,796.00	$0.00	$0.00	$3,796.00	80 h	0 h	0 h	0 h	80 h
58	Bill Cooper	10%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
This task provides effort for the preparation of the Layer Zero Si dry gas system safety documentation and PORCS, including "walk-thrus" required for permission to operate the system.

M&S BOS-
None.

Labor BOE-
Based on RunIIa experience and considering that review/updating of existing documentation constitutes the bulk of the task, two weeks time by an mechanical engineer, and supervision by a physicist are required for this task. Bill Cooper and Dan Olis are the preferred personnel.

1.5.2.1.8.3 Prepare Beampipe Handling Safety Documentation — Tue 9/6/05 — Mon 9/19/05 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
61	Rich Smith	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
This task provides effort for the preparation of the beryllium beampipe safety documentation.

M&S BOS-
None.

Labor BOE-
Based on RunIIa experience and considering that review/updating of existing documentation constitutes the bulk of the task, one week time by a physicist is required for this task. Rich Smith is the preferred personnel.

1.5.2.1.8.4 Prepare Tevatron Beampipe Leak Checking Procedure — Tue 9/6/05 — Mon 9/19/05 — $0.00 — $0.00 — $1,898.00 — $1,898.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	50%	$1,898.00	$0.00	$0.00	$1,898.00	40 h	0 h	0 h	0 h	40 h
59	Russ Rucinski	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
This task provides effort for the preparation of the Tevatron beampipe leak checking safety documentation.

M&S BOS-
None.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Prepare Tevatron Beampipe Leak Checking Procedure" continued							

Notes

Labor BOE-
Based on RunIIa experience and considering that review/updating of existing documentation constitutes the bulk of the task, one week time by an engineer is required for this task. Russ Rucinski is the preferred personnel.

1.5.2.1.8.5	**Silicon Safety and PORC Documentation Completed**	Mon 9/19/05	Mon 9/19/05	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone - All safety and PORC documentation for RunIIb are complete.

1.5.2.1.9	**Silicon Infrastructure Prepared**	Mon 9/19/05	Mon 9/19/05	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone-All infrastructure required by the silicon (cables, chiller and piping, dry gas system, HV and LV systems, installation fixtures) is complete.

1.5.2.2	**Remove Outer Beampipe Sections, Open Detector**	Wed 3/1/06	Thu 3/9/06	$0.00	$0.00	$13,667.20	$13,667.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,467.40	$0.00	$0.00	$2,467.40	52 h	0 h	0 h	0 h	52 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	52 h	0 h	0 h	0 h	52 h

Notes

WBS Definition-
This summary task makes CH rad survey, makes stickmike survey of EF's, CF's, opens the forward muon shields, opens EF's, removes BLM's from EF's, measures & fixes EC beampipes to EC's, closes EF's, isolates and backfills Tev beampipe, installs remote purge lines to crosses at quads, removes FPD veto counters on SNEG pipes, removes Quad beampipe accessories and SNEG's, measures beampipe interiors, installs collapsible beampipe, opens CF's, opens EC's, and prepares the CC-EC gaps for access (scaffolds, lighting, masks to protect CFT fibers), and begins silicon warmup.

1.5.2.2.1	Perform CH Rad survey, Make stickmike survey of EF's, CF's	Wed 3/1/06	Wed 3/1/06	$0.00	$0.00	$689.40	$689.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
41	SurveyorF	300%	$689.40	$0.00	$0.00	$689.40	24 h	0 h	0 h	0 h	24 h

Notes

WBS Definition-
This task performs the required rad survey of the collision hall before general personnel access permitted, makes stickmike survey of EF's, CF's.

M&S BOE-
NA

Labor BOE-
RunIIa experience where these tasks were done on several occasions, forms the basis of estimate for effort.

1.5.2.2.2	Open forward muon shields, EF's	Thu 3/2/06	Thu 3/2/06	$0.00	$0.00	$649.40	$649.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$189.80	$0.00	$0.00	$189.80	4 h	0 h	0 h	0 h	4 h
40	SeniorMechTechF	400%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task opens forward muon shielding (clamshells and noses) and retracts bridges, makes rad survey of exposed beampipes and quads, and opens the N & S EF's.

M&S BOE-
NA

Labor BOE-
RunIIa experience where these tasks were done on several occasions, forms the basis of estimate for effort.

1.5.2.2.3	Remove BLM's, Measure & Fix EC beampipes to Calorimeters	Thu 3/2/06	Fri 3/3/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task makes rad survey of BLM area, records/removes/stores BLM's, records and fixes EC beampipes with respect to calorimeters, and closes N & S EF's

M&S BOE-
NA

Labor BOE-
RunIIa experience where these tasks were done during 2004 shutdown.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.2.4	Record and remove FPD Vetoes from SNEGs	Fri 3/3/06	Mon 3/6/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task extends muon shield bridge arms, installs work platform on arms, records/removes/stores FPD vetoes from SNEG pipes.

M&S BOE-
NA

Labor BOE-
RunIIa experience where these tasks were done during 2004 shutdown.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.2.5	Purge Beampipe, Remove N Quad BP items & SNEG, inspect	Mon 3/6/06	Tue 3/7/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task measures and records length of quad bellows, tee, and cross, isolates D0 beampipe at
C4 adn D1 gate valves, installs a GN2 purge of beampipe via S (D1) cross, installs a remotely operable purge line in N and S EC beampipes (via copper lines through nose iron holes and thence to C truss). Allow BD to remove N bellows/cross/tee; blank off N SNEG pipe flange. (Pump/backfill/store components). Start N EC purge, remove/store N SNEG. Remove ECN beampipe extension spool. Check internal diameter of N EC beampipe; visually check with borescope. Measure and record temperatures in N EC beampipe. Reattach N EC beampipe extension with purge.

M&S BOE-
NA

Labor BOE-
RunIIa experience where these tasks were done during 2004 shutdown.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.2.6	Remove S Quad BP items & SNEG, inspect BP	Mon 3/6/06	Tue 3/7/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task allows BD to remove S bellows/cross/tee; blank off S SNEG pipe flange. (Pump/backfill/store components). Start S EC purge, remove/store S SNEG. Remove ECS beampipe extension spool. Check internal diameter of S EC beampipe; visually check with borescope. Measure and record temperatures in S EC beampipe. Reattach S EC beampipe extension with purge. Install N & S compressible beampipe spacers. Lock beampipes to EC's.
Verify purges.

M&S BOE-
NA

Labor BOE-
RunIIa experience where these tasks were done during 2004 shutdown.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.2.7	Survey C-layer Muon Trusses	Fri 3/3/06	Tue 3/7/06	$0.00	$0.00	$919.20	$919.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
41	SurveyorF	200%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
This task surveys the C-layer trusses

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for this task.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.2.8	Open EF's, CF's, EC's	Tue 3/7/06	Wed 3/8/06	$0.00	$0.00	$1,758.40	$1,758.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	600%	$1,378.80	$0.00	$0.00	$1,378.80	48 h	0 h	0 h	0 h	48 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Open EF's, CF's, EC's" continued

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes working platforms and access hardware from muon bridges and sidewalks, retracts muon shields, opens EF's, opens CF's, opens EC's, makes rad survey of exposed beampipe and calorimeter surfaces, and installs gap access hardware

M&S BOE-
NA

Labor BOE-
RunIIa experience where this task was done (especially during the 2004 shutdown) forms the basis of estimate.

1.5.2.2.9 Install Gap Access Hardware, Make Rad Survey — Wed 3/8/06 — Thu 3/9/06 — $0.00 — $0.00 — $1,758.40 — $1,758.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	600%	$1,378.80	$0.00	$0.00	$1,378.80	48 h	0 h	0 h	0 h	48 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	600%	$0.00	$0.00	$0.00	$0.00	48 h	0 h	0 h	0 h	48 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

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1.5.2.2.10 Warm Silicon — Wed 3/8/06 — Thu 3/9/06 — $0.00 — $0.00 — $229.80 — $229.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
40	SeniorMechTechF	100%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
50	GapS	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
51	Cathedral	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task warms the silicon above CH dewpoint; 12-24 hrs is sufficient.

M&S BOE-
NA

Labor BOE-
RunIIa experience where thiese operations were done during 2004 shutdown forms the basis of estimate.

1.5.2.2.11 Silicon Warm, Detector Open & Ready for Access — **Thu 3/9/06** — **Thu 3/9/06** — **$0.00** — **$0.00** — **$0.00** — **$0.00**

Notes

WBS Definition-
Milestone-Be beampipe disconnected from EC beampipes. First Be assay wipes out for analysis.

1.5.2.3 Disconnect Inner Beampipe — **Thu 3/9/06** — **Mon 3/13/06** — **$0.00** — **$0.00** — **$2,707.40** — **$2,707.40**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$949.00	$0.00	$0.00	$949.00	20 h	0 h	0 h	0 h	20 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h

Notes

WBS Definition-
This summary task closes EF's/EC's, removes SNEG pipes, drains Si coolant, Opens EC's/EF's, cuts off inner beampipes, purges Si coolant lines.

1.5.2.3.1 Prepare for EC/Be disconnect, Make Rad Survey — Thu 3/9/06 — Thu 3/9/06 — $0.00 — $0.00 — $649.40 — $649.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$189.80	$0.00	$0.00	$189.80	4 h	0 h	0 h	0 h	4 h
40	SeniorMechTechF	400%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task (optionally) stops dry air purge, removes tedlar membranes, removes foam, G10 for TLD',s removes bellows protectors at EC/Be joints. Past experience indicates Be wiping isn't necessary. Task also prepares GN2 purge lines for Be pipe, and EC pipes. Make Rad survey of newly exposed beampipe regions.

M&S BOE-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Prepare for EC/Be disconnect, Make Rad Survey" continued

Notes

NA

Labor BOE-
RunIIa experience where these operations were done during 2004 shutdown forms the basis of estimate.

1.5.2.3.2	Disconnect Be pipe, establish EC and Be pipe purges	Fri 3/10/06	Fri 3/10/06	$0.00	$0.00	$554.50	$554.50

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	50%	$94.90	$0.00	$0.00	$94.90	2 h	0 h	0 h	0 h	2 h
40	SeniorMechTechF	400%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
59	Russ Rucinski	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h

Notes

WBS Definition-
This task unlocks N beampipe spacer, disconnects N EC/Be joint, retracts N EC beampipe ~ 30 inches, establishes purge of N EC beampipe; then repeats for S EC beampipe and EC/Be joint. Establishes purge of Be pipe

M&S BOE-
NA

Labor BOE-
RunIIa experience, careful planning and testing of all tooling, forms the basis of estimate.

1.5.2.3.3	Cut EC pipe ends, Record Temperatures in EC pipes	Fri 3/10/06	Fri 3/10/06	$0.00	$0.00	$554.50	$554.50

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	50%	$94.90	$0.00	$0.00	$94.90	2 h	0 h	0 h	0 h	2 h
40	SeniorMechTechF	400%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task cuts off EC/Be flanges on EC beampipes, measures temperatures in EC pipes, reestablishes purges, deenergize pipe spacers.

M&S BOE-
NA

Labor BOE-
RunIIa experience, careful planning and testing of all tooling, forms the basis of estimate.

1.5.2.3.4	Power Outage in Collision Hall	Mon 3/13/06	Mon 3/13/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
This task provides 1-day window for power outage in collision hall.

M&S BOE-
NA

Labor BOE-
NA

1.5.2.3.5	**Be Beampipe Disconnected**	**Mon 3/13/06**	**Mon 3/13/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-Be beampipe disconnected from EC beampipes. First Be assay wipes out for analysis.

1.5.2.4	**Remove H-disks**	**Tue 3/14/06**	**Tue 3/21/06**	**$0.00**	**$0.00**	**$5,925.40**	**$5,925.40**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,087.80	$0.00	$0.00	$2,087.80	44 h	0 h	0 h	0 h	44 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	44 h	0 h	0 h	0 h	44 h

Notes

WBS Definition-
This summary task uncables and removes H-disks. The inner H-disks will be reinstalled after L0 is installed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.4.1	Uncable Outer H disks	Tue 3/14/06	Tue 3/14/06	$0.00	$0.00	$720.00	$720.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
38	SeniorElecTechF	300%	$720.00	$0.00	$0.00	$720.00	24 h	0 h	0 h	0 h	24 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
69	John Fogelsong	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task disconnects and removes the low mass cables (48 per side) from the N & S outer H disks

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.4.2	Stop Coolant flow, drain and purge coolant lines	Tue 3/14/06	Tue 3/14/06	$0.00	$0.00	$189.80	$189.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
39	SeniorMechEngF	100%	$189.80	$0.00	$0.00	$189.80	4 h	0 h	0 h	0 h	4 h
49	GapN	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
51	Cathedral	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task istops coolant flow to H-disks, drains and purges coolant lines.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.4.3	Disconnect Coolant lines, Remove Rohacell Be Support	Tue 3/14/06	Tue 3/14/06	$0.00	$0.00	$419.60	$419.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
39	SeniorMechEngF	100%	$189.80	$0.00	$0.00	$189.80	4 h	0 h	0 h	0 h	4 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
51	Cathedral	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
98	Sasha Leflat	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task isolates and cuts/disconnects coolant lines to outer H-disks, disconnects/plugs dry air purge supply to outer H-disks, stops SMT dry air purge, removes split Rohacell Be beam pipe supports.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.4.4	Install H-disk removal fixtures	Wed 3/15/06	Wed 3/15/06	$0.00	$0.00	$379.60	$379.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
49	GapN	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task installs the H-disk removal fixtures.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Install H-disk removal fixtures" continued							

Notes

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

1.5.2.4.5	Remove N&S Outer H-Disks	Thu 3/16/06	Thu 3/16/06	$0.00	$0.00	$514.50	$514.50

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	125%	$0.00	$0.00	$0.00	$0.00	5 h	0 h	0 h	0 h	5 h
39	SeniorMechEngF	150%	$284.70	$0.00	$0.00	$284.70	6 h	0 h	0 h	0 h	6 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	500%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	25%	$0.00	$0.00	$0.00	$0.00	1 h	0 h	0 h	0 h	1 h
94	Dan Olis	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
98	Sasha Leflat	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task installs removes the outer H-disks from CFT barrel 3. The H disks are inserted in existing handling cases and removed from the work area. Change H-disk coolant flow nozzels for L0 if necessary.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

1.5.2.4.6	Make Be assay of beampipes	Thu 3/16/06	Tue 3/21/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
49	GapN	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h

Notes

WBS Definition-
This task permits ES&H technician to make Be wipes of exposed RunIIa Be pipe surfaces, send out for analysis. Further direct work on (i.e. handling) Be pipe awaits results of analysis.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience.

1.5.2.4.7	Uncable Inner H disks	Thu 3/16/06	Fri 3/17/06	$0.00	$0.00	$720.00	$720.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
38	SeniorElecTechF	300%	$720.00	$0.00	$0.00	$720.00	24 h	0 h	0 h	0 h	24 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
69	John Fogelsong	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task disconnects and reroutes the low mass cables (48 per side) from the N & S inner H disks. This task assumes this work can be undertaken while the Be assay is in progress.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with inst

1.5.2.4.8	Install H-disk removal fixtures	Fri 3/17/06	Mon 3/20/06	$0.00	$0.00	$379.60	$379.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
49	GapN	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install H-disk removal fixtures" continued

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	50%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task isolates and cuts/disconnects coolant lines for inner H-disks, disconnects and plugs the dry air purge for them and installs the H-disk removal fixtures. This task assumes this work can be undertaken while the Be assay is in progress.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

1.5.2.4.9 Remove N&S Inner H-Disks — Mon 3/20/06 — Mon 3/20/06 — $0.00 — $0.00 — $514.50 — $514.50

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	125%	$0.00	$0.00	$0.00	$0.00	5 h	0 h	0 h	0 h	5 h
39	SeniorMechEngF	150%	$284.70	$0.00	$0.00	$284.70	6 h	0 h	0 h	0 h	6 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	500%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	25%	$0.00	$0.00	$0.00	$0.00	1 h	0 h	0 h	0 h	1 h
94	Dan Olis	50%	$0.00	$0.00	$0.00	$0.00	2 h	0 h	0 h	0 h	2 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
98	Sasha Leflat	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task removes the inner Hdisks from CFT barrel 3. The H disks are inserted in existing handling cases and removed from the work area. This task assumes this work can be undertaken while the Be assay is in progress.

M&S BOE-
NA

Labor BOE-
Estimates are based on Run2a installation experience, reduced by considerations of the expected simpler task of removal as compared with installation.

1.5.2.4.10 H-disks Removal Complete — **Mon 3/20/06** — **Mon 3/20/06** — **$0.00** — **$0.00** — **$0.00** — **$0.00**

Notes

WBS Definition-
Milestone-H-disk Removal Complete

1.5.2.5 Remove Run IIa Be Beampipe via NEC — **Tue 3/21/06** — **Wed 3/29/06** — **$0.00** — **$0.00** — **$11,199.80** — **$11,199.80**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,277.60	$0.00	$0.00	$2,277.60	48 h	0 h	0 h	0 h	48 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	48 h	0 h	0 h	0 h	48 h

Notes

WBS Definition-
This summary task removes RunIIa Be Beampipe.

1.5.2.5.1 Install Be pipe handling equipment in N Gap, Brunson in S gap — Tue 3/21/06 — Wed 3/22/06 — $0.00 — $0.00 — $1,978.00 — $1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task installs the L0 tables & rails in the N gap, mounts Brunson in S gap to sight clearances of beampipe during removal (purge bags removed to facilitate this), replaces N outflow purge bag on end of Be pipe, moves Be pipe ~ 5" N, attaches forward stage clamp to N end of Be pipe to support it, removes Be pipe supports on N SMT membrane, moves Be pipe 11" N, attach secondary stage clamp to Be pipe in N gap, remove S Be supports on SMT membrane.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install Be pipe handling equipment in N Gap, Brunson in S gap, begin removal of Be pipe" continued

Notes

M&S BOE-
NA

Labor BOE-
RunIIa experience from original Be pipe installation.

1.5.2.5.2	Retract Be pipe to NEC, Remove N Gap Stages, Rails	Wed 3/22/06	Thu 3/23/06	$0.00	$0.00	$1,598.40	$1,598.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	300%	$1,138.80	$0.00	$0.00	$1,138.80	24 h	0 h	0 h	0 h	24 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	300%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task continues Be motion N (remove EC pipe purge plug) out of SMT into N EC pipe (while managing purge there) until Be pipe clears tracker and is fully inside N EC pipe and unattached from stage mounts. Remove stages, rails, tables from N gap. Pull N EC beampipe inward to lock collapsible spacer in extended position, and deploy purge lines appropriately.

M&S BOE-
NA

Labor BOE-
RunIIa experience from original Be pipe installation.

1.5.2.5.3	Close ECN, EFN, Make Work Platform at EFN	Thu 3/23/06	Fri 3/24/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes access hardware in N gap, closes ECN, installs ladder(s) to beam pipe, blocks motion of ECN beampipe with temporary bar, removes ladders, closes EFN and EFN and installs a work platform on shield arms,

M&S BOE-
NA

Labor BOE-
RunIIa experience.

1.5.2.5.4	Remove table & brunson, install S gap work scaffold	Thu 3/23/06	Fri 3/24/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes the Brunson and table as needed from the S gap to allow elelctrical work there.

M&S BOE-
NA

Labor BOE-
RunIIa experience from 2004 shutdown.

1.5.2.5.5	Remove Be pipe from Collision Hall	Fri 3/24/06	Fri 3/24/06	$0.00	$0.00	$649.40	$649.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$189.80	$0.00	$0.00	$189.80	4 h	0 h	0 h	0 h	4 h
40	SeniorMechTechF	400%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task remove Be pipe from ECN beampipe: Remove collapsible beampipe spacer, negotiate Be pipe past quad and out of iron; place in storage container and remove purge line and move container to Si cage area an reestablish purge. Plug ECN pipe with baffeled stopper.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Remove Be pipe from Collision Hall" continued							

Notes

M&S BOE-
NA

Labor BOE-
RunIIa experience from original Be pipe installation plus careful consideration of pipe purge management.

1.5.2.5.6	Install New Adapter Cards, LV cables in S Gap	Fri 3/24/06	Wed 3/29/06	$0.00	$0.00	$2,098.80	$2,098.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
38	SeniorElecTechF	100%	$720.00	$0.00	$0.00	$720.00	24 h	0 h	0 h	0 h	24 h
40	SeniorMechTechF	200%	$1,378.80	$0.00	$0.00	$1,378.80	48 h	0 h	0 h	0 h	48 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	48 h	0 h	0 h	0 h	48 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	96 h	0 h	0 h	0 h	96 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
69	John Fogelsong	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h

Notes

WBS Definition-
This task removes old Adapter Cards and standoffs in S gap, installs new standoffs and AC's, installs LV and Temp Mon AWG-change panels, connects 12 10AWG LV cable from fuse panel to AWG-change panel, 22 AWG jumpers from AWG-change panel to AC. Operates power supplies. Time is allowed to test AC's with walking Junction card.

M&S BOE-
NA

Labor BOE-
RunIIa experience from original AC installation forms the basis of estimate for effort.

1.5.2.5.7	**Run IIa Beampipe Removal Complete**	**Wed 3/29/06**	**Wed 3/29/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-RunIIa Be pipe removal completed.

1.5.2.6	**Load L0 and RunII Be pipe in ECN Beampipe**	**Wed 3/29/06**	**Fri 3/31/06**	**$0.00**	**$0.00**	**$4,490.50**	**$4,490.50**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$949.00	$0.00	$0.00	$949.00	20 h	0 h	0 h	0 h	20 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h

Notes

WBS Definition-
This summary task brings L0 and RunIIb Be pipe to DAB and loads them in the NEC beampipe.

1.5.2.6.1	Make dry run with dummy L0	Wed 3/29/06	Thu 3/30/06	$0.00	$0.00	$1,483.50	$1,483.50

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
39	SeniorMechEngF	200%	$1,138.80	$0.00	$0.00	$1,138.80	24 h	0 h	0 h	0 h	24 h
40	SeniorMechTechF	100%	$344.70	$0.00	$0.00	$344.70	12 h	0 h	0 h	0 h	12 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h

Notes

WBS Definition-
This task moves ECN pipe (on scissors jack) 13" away from tracker, installs rail with H&V stages in EFN, attaches dummy L0 carrier box (with dummy L0 inside) to table, rough aligns stages with ECN pipe, remove carrier from stages and lay aside in shield, remove stopper from ECN pipe, replace carrier on stages, open carrier and slide dummy L0 into ECN pipe. Adjust stages to permit safe motion of L0 dummy. Attach fish to dummy L0 and move it to inner stopper. Measure distance in pipe, remove dummy L0, place in carrier and remove from collision hall.

M&S BOE-
NA

Labor BOE-
RunIIa experience with beam pipes.

1.5.2.6.2	Load L0 and RunIIBe pipe in ECN	Fri 3/31/06	Fri 3/31/06	$0.00	$0.00	$2,058.00	$2,058.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Load L0 and RunIIBe pipe in ECN" continued

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	300%	$1,138.80	$0.00	$0.00	$1,138.80	24 h	0 h	0 h	0 h	24 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task moves L0 into CH and onto stages in EF shield hole, unpackages it and slides it into ECN beampipe, pushes it S the proper distance, moves packaged Be pipe into CH and places it on L0 carrier on stages in EF shield hole, cleans Be pipe package, inserts it in the ECN beampipe, removes carrier box, stages and table, mounts ECN extension pipe and purge plumbing, moves ECN beampipe to proper axial position, remounts collapsible spacer.

M&S BOE-
NA

Labor BOE-
RunIIa experience with beam pipes.

1.5.2.6.3 L0 and Be Pipe in ECN Beampipe — Fri 3/31/06 — Fri 3/31/06 — $0.00 — $0.00 — $0.00 — $0.00

Notes

WBS Definition-
Milestone-L0 and Be pipe loaded in ECN beampipe.

1.5.2.7 Open ECN, Install L0 Installation Tooling — Mon 4/3/06 — Tue 4/11/06 — $0.00 — $0.00 — $11,799.00 — $11,799.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,467.40	$0.00	$0.00	$2,467.40	52 h	0 h	0 h	0 h	52 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	52 h	0 h	0 h	0 h	52 h

Notes

WBS Definition-
This summary task opens ECN, Installs N gap access hardware and L0 Installation rails, stages

1.5.2.7.1 Remove N scaffolding, Open EFN and ECN, Install Gap acces — Mon 4/3/06 — Mon 4/3/06 — $0.00 — $0.00 — $1,298.80 — $1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes work platform and scaffolding at ECN, retracts shield arms back into C truss, opens EFN, ECN. Installs N Gap access hardware.

M&S BOE-
NA

Labor BOE-
RunIIa experience.

1.5.2.7.2 Install New Adapter Cards, LV cables in N Gap — Tue 4/4/06 — Thu 4/6/06 — $0.00 — $0.00 — $2,098.80 — $2,098.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
38	SeniorElecTechF	100%	$720.00	$0.00	$0.00	$720.00	24 h	0 h	0 h	0 h	24 h
40	SeniorMechTechF	200%	$1,378.80	$0.00	$0.00	$1,378.80	48 h	0 h	0 h	0 h	48 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	48 h	0 h	0 h	0 h	48 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	96 h	0 h	0 h	0 h	96 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
69	John Fogelsong	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h

1.5.2.7.3 Install levels on S CC and table & Brunson in S gap — Mon 4/3/06 — Mon 4/3/06 — $0.00 — $0.00 — $989.00 — $989.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
39	SeniorMechEngF	400%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install levels on S CC and table & Brunson in S gap" continued

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task installs levels on S face of CC, and table and rails and Brunson in S gap.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.7.4	Install levels on N CC and Table & Rails in N Gap	Fri 4/7/06	Fri 4/7/06	$0.00	$0.00	$989.00	$989.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
39	SeniorMechEngF	400%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task installs levels on N CC face, and table and rails in N gap.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.7.5	Mount Stages & Align N short Rails	Fri 4/7/06	Fri 4/7/06	$0.00	$0.00	$989.00	$989.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
39	SeniorMechEngF	400%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task aligns table and short rails in N gap relative to SMT membrane opening using Brunson in S gap.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.7.6	Move Brunson from S gap to N gap, install table & rails in S ga	Mon 4/10/06	Mon 4/10/06	$0.00	$0.00	$989.00	$989.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
39	SeniorMechEngF	400%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
40	SeniorMechTechF	200%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Move Brunson from S gap to N gap, install table & rails in S gap" continued

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h

Notes

WBS Definition-
This task moves the Brunson from the S gap to the N gap (or more likely, installs a second Brunson in the N gap, leaving the first Brunson in the S gap), installs tables & rails in S gap.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.7.7	Mount Stages & Align S short Rails	Mon 4/10/06	Tue 4/11/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task aligns table and short rails in S gap relative to SMT membrane opening using Brunson in N gap.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.7.8	**L0 Installation Tooling Installed**	**Tue 4/11/06**	**Tue 4/11/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-L0 installation mounts installed in gaps.

1.5.2.8	**L0 Installation Tooling & L0 Mounts**	**Tue 4/11/06**	**Tue 4/18/06**	**$0.00**	**$0.00**	**$12,966.80**	**$12,966.80**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,087.80	$0.00	$0.00	$2,087.80	44 h	0 h	0 h	0 h	44 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	44 h	0 h	0 h	0 h	44 h

Notes

WBS Definition-
This summary task aligns and tests L0 installation mounts in gaps.

1.5.2.8.1	Install N & S L0 Mounts on SMT membrane	Tue 4/11/06	Thu 4/13/06	$0.00	$0.00	$3,956.00	$3,956.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
39	SeniorMechEngF	400%	$3,036.80	$0.00	$0.00	$3,036.80	64 h	0 h	0 h	0 h	64 h
40	SeniorMechTechF	200%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	64 h	0 h	0 h	0 h	64 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes

WBS Definition-
This task attaches mounting tool onto S stage clamps, then installs and glue L0 mounts to existing SMT membrane. Dual tooling and Brunsons might allow same in N gap at same time. Allow overnight cure before proceeding.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install N & S L0 Mounts on SMT membrane" continued

Notes

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.8.2	Prepare long rails in S gap	Thu 4/13/06	Fri 4/14/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes mount tool and short rails from S gap, installs long rail on S table, mounts stages and aligns long rail to SMT membrane opening axis using Brunson in N gap.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.8.3	Install Long L0 Installation Tool on S rails & Check Deflections	Fri 4/14/06	Mon 4/17/06	$0.00	$0.00	$2,967.00	$2,967.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
39	SeniorMechEngF	400%	$2,277.60	$0.00	$0.00	$2,277.60	48 h	0 h	0 h	0 h	48 h
40	SeniorMechTechF	200%	$689.40	$0.00	$0.00	$689.40	24 h	0 h	0 h	0 h	24 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	48 h	0 h	0 h	0 h	48 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h

Notes

WBS Definition-
This task brings first half of L0 long installation tool into S gap, removes purge stopper from ES pipe, inserts tool into ECS pipe, brings in 2nd half of tool and joins it to first half; adjust stages to align tool to SMT membrane using Brunson in N gap, checks motion of tool into SMT with weight added which simulates L0.

M&S BOE-
NA

Labor BOE-
RunIIa experience with beampipe mounts, plus consideration of

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1.5.2.8.4	Remove Brunson from N Gap, prepare stages in N gap	Tue 4/18/06	Tue 4/18/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes Brunson from N gap, installs back half of rail support, short rails on back half, aligns to front rails, installs stages and mounting clamps on N rails, positions one stage at N end of rails.

M&S BOE-
NA

Labor BOE-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Remove Brunson from N Gap, prepare stages in N gap" continued							

Notes
RunIIa experience with beampipe mounts, plus consideration of

1.5.2.8.5	**Tooling & Mounts ready for L0 Insertion**	**Tue 4/18/06**	**Tue 4/18/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
Milestone- L0 installed and connected to readout system.

1.5.2.9	**Insert L0 in SMT & Install Junction Card Mounts**	**Wed 4/19/06**	**Thu 4/20/06**	**$0.00**	**$0.00**	**$4,715.20**	**$4,715.20**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes
WBS Definition-
This summary task installs L0 in the RunIIa SMT and stores new Be beampipe in ECS.

1.5.2.9.1	Draw L0 into RunIIa SMT	Wed 4/19/06	Wed 4/19/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes
WBS Definition-
This task draws L0 into position while managing purge in N EC (and eventually S EC) beampipes, using the N rails and clamp system as L0 is withdrawn from the ECN beampipe and using long installation tool (which ultimately reenters ECS pipe) as L0 enters the SMT, supports long tool on S gap rails and stages, rotates L0 15 degrees when it reaches correct Z position, and attaches S connection ring between L0 and ring mount previously glued on membrane; installs ball & cone mounts; repeats for N end, and removes short tool from N gap. Removes all installation tooling from S gap and removes cable extension supports from L0, taping them away from the beampipe bore.

M&S BOE-
NA

Labor BOE-
Detailed consideration of operations involved, plus experience with RunIIa silicon installation forms the basis of estimate.

1.5.2.9.2	Install N & S Junction Card Mounts on SMT membrane	Thu 4/20/06	Thu 4/20/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes
WBS Definition-
This task glues N junction card mounts to existing SMT membrane. After glue sets, repeat in S gap. Allow overnight cure before working with mounts.

M&S BOE-
NA

Labor BOE-
RunIIa experience in gaps during Fall 2004 shutdown.

1.5.2.9.3	**L0 Mechanical Installation Complete**	**Thu 4/20/06**	**Thu 4/20/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
Milestone- Be beampipe installed in L0.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.10	Install Be Beampipe, Junction Cards, Connect L0 & Test	Fri 4/21/06	Fri 5/12/06	$0.00	$0.00	$19,191.80	$19,191.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$5,883.80	$0.00	$0.00	$5,883.80	124 h	0 h	0 h	0 h	124 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	124 h	0 h	0 h	0 h	124 h

Notes

WBS Definition-
This summary task installs the new Be beampipe.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.10.1	Install Be Beampipe into L0	Fri 4/21/06	Fri 4/21/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task draws the RunIIb Be pipe into position while managing purge in N EC, using the N rails and V-blocks, unpackaging Be pipe as it moves S towards L0, eventually attaching short tool on N end to aid its progress southward. Removes N stages, checks for electrical isolation from L0,
removes all installation tooling from N gap, and levels from faces of CC.

M&S BOE-
NA

Labor BOE-
Detailed consideration of operations involved, plus experience with RunIIa silicon installation forms the basis of estimate.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.10.2	Connect and leak test L0 cooling manifold	Mon 4/24/06	Tue 4/25/06	$0.00	$0.00	$2,967.00	$2,967.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
39	SeniorMechEngF	400%	$2,277.60	$0.00	$0.00	$2,277.60	48 h	0 h	0 h	0 h	48 h
40	SeniorMechTechF	200%	$689.40	$0.00	$0.00	$689.40	24 h	0 h	0 h	0 h	24 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	48 h	0 h	0 h	0 h	48 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h

Notes

WBS Definition-
This task connects L0 cooling manifold and leak tests all connections.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.10.3	Install Junction Cards, TempMon Cards, Connect L0 Electrical	Tue 4/25/06	Mon 5/1/06	$0.00	$0.00	$2,798.40	$2,798.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
38	SeniorElecTechF	100%	$960.00	$0.00	$0.00	$960.00	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$1,838.40	$0.00	$0.00	$1,838.40	64 h	0 h	0 h	0 h	64 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	64 h	0 h	0 h	0 h	64 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	128 h	0 h	0 h	0 h	128 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
69	John Fogelsong	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
99	Chris Tolian	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
This task installs the 12 2-channel junction cards per side. The twisted pair cables on the junction cards connect to the adapter cards on the horseshoes. Six inner junction cards are installed all the way to the adapter cards on the horseshoes, and tested (junction card + twisted pair cable + adapter card), before proceeding with the outer ring of 6 junction cards. The digital cables from L0 are connected to the junction cards as the work proceeds.
The 80-conductor cables and clock cables are reconnected to the adapter cards also.
Connect rad mon and Temp mon cables.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Install Junction Cards, TempMon Cards, Connect L0 Electrically" continued							

Notes

M&S BOE-

Labor BOE-
RunIIa experience forms the basis of estimate for effort. There are 12 2-channel junction cards per side, and four can be installed per day per person. Dave Butler and Denny Graham are the preferred persons, with Linda Bagby; testing is done by Fermilab physicists -- Lipton, Numerotski. 6 temperature monitor cards on each horseshoe take an hour to install.

1.5.2.10.4	Begin technical commissioning of L0 Silicon - FNAL	Mon 5/1/06	Fri 5/12/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	200%	$0.00	$0.00	$0.00	$0.00	144 h	0 h	0 h	0 h	144 h

Notes

WBS Definition-
Begin electronic checkout of L0 silicon. Work continues until H-disks are fully installed and detector is closed.

M&S BOE-
NA

Labor BOE-
Run2a experience forms the basis of the estimates for labor.

1.5.2.10.5	Begin technical commissioning of L0 Silicon - Univ	Mon 5/1/06	Fri 5/12/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	144 h	0 h	0 h	0 h	144 h

Notes

WBS Definition-
Begin electronic checkout of L0 silicon. Work continues until H-disks are fully installed and detector is closed.

M&S BOE-
NA

Labor BOE-
Run2a experience forms the basis of the estimates for labor.

1.5.2.10.6	Weld EC Beampipe stubs	Mon 5/1/06	Tue 5/2/06	$0.00	$0.00	$689.40	$689.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
42	WelderF	100%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	300%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task welds S EC beampipe stub; repeats for N side; installs vacuum pump and HMS leak detector in S gap;

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate.

1.5.2.10.7	Connect Spools to Be pipe, leakcheck, disconnect & retract EC	Tue 5/2/06	Thu 5/4/06	$0.00	$0.00	$4,875.20	$4,875.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	400%	$3,036.80	$0.00	$0.00	$3,036.80	64 h	0 h	0 h	0 h	64 h
40	SeniorMechTechF	400%	$1,838.40	$0.00	$0.00	$1,838.40	64 h	0 h	0 h	0 h	64 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	64 h	0 h	0 h	0 h	64 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes

WBS Definition-
This task connects the tee to S EC beampipe flange, connects extension spool to other end of tee, pulls pipe northward to connect to Be pipe flange; Pulls N EC beampipe inward (spacer locks at its extended position), makes connection to Be pipe, closes all valves on EC purge lines at C trusses, pulls vacuum on pipe and leakchecks stub welds, Be flange connections; disconnects N EC pipe joint at extension piece, unlock NEC pipe and move N; disconnect S EC pipe joint at tee, remove tee and leak-checking equipment; reestablish purges in EC pipes.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.10.8	**RunIIb Be Beampipe Installed, L0 Cabled**	Thu 5/4/06	Thu 5/4/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone- new Be beampipe installed in L0 and junction cards installed and connected to adapter cards on horseshoes.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.11	**Install Inner H-disks**	Thu 5/4/06	Wed 5/10/06	$0.00	$0.00	$9,430.40	$9,430.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
This summary task installs the inner H-disks.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.11.1	Install and Cable H-disks, Connect Cooling Lines, Install Beam	Thu 5/4/06	Wed 5/10/06	$0.00	$0.00	$7,912.00	$7,912.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
39	SeniorMechEngF	400%	$6,073.60	$0.00	$0.00	$6,073.60	128 h	0 h	0 h	0 h	128 h
40	SeniorMechTechF	200%	$1,838.40	$0.00	$0.00	$1,838.40	64 h	0 h	0 h	0 h	64 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	64 h	0 h	0 h	0 h	64 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	64 h	0 h	0 h	0 h	64 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	128 h	0 h	0 h	0 h	128 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
This task installs the H-disk installation fixtures, mounts the H-disks (beampipe purge lines pass through central holes in disks), connects cooling lines and the low mass cables (48 per side). Leak-checks cooling lines, installs beampipe support disks at outer H-disk mounts, adjusting as needed to align with EC pipes; Starts dry air purge; Tests all connections.

M&S BOE-
NA

Labor BOE-
RunIIa experience installing the H-disks forms the basis of estimate.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.11.2	**H-disks Installed**	Wed 5/10/06	Wed 5/10/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone- Inner H-disks installed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.12	**Make Up Inner Beampipes, Cool Silicon**	Wed 5/10/06	Mon 5/15/06	$0.00	$0.00	$4,036.00	$4,036.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$1,138.80	$0.00	$0.00	$1,138.80	24 h	0 h	0 h	0 h	24 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	24 h	0 h	0 h	0 h	24 h

Notes

WBS Definition-
This summary task opens the gaps and makes up the the inner beampipes, cools silicon.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.12.1	Install beampipe supports, make EC/Be pipe joints	Wed 5/10/06	Thu 5/11/06	$0.00	$0.00	$1,978.00	$1,978.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
39	SeniorMechEngF	400%	$1,518.40	$0.00	$0.00	$1,518.40	32 h	0 h	0 h	0 h	32 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
74	Youri Orlov	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
93	Mike Roman	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
94	Dan Olis	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
95	Joe Howell	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task makes up connections between new flanges and extensions bellows, manages EC pipe purges and collapsible spacers as EC pipes are drawn inward to make the connections, adjusts bellows restraints, installs leak-check bags on joints with remote supply lines.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Install beampipe supports, make EC/Be pipe joints" continued							

Notes

Labor BOE-
2004 shudown experience forms the basis of estimate for effort.

1.5.2.12.2	Install H-disk insulation & Tedlar Membranes, Rad monitors	Thu 5/11/06	Fri 5/12/06	$0.00	$0.00	$459.60	$459.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task installs TLD rad monitors, inner H-disk foam insulation and Tedlar cover over tracker region.

M&S BOE-
NA

Labor BOE-
RunIIa and 2004 shudown experience forms the basis of estimate for effort.

1.5.2.12.3	Cool Silicon	Fri 5/12/06	Mon 5/15/06	$0.00	$0.00	$459.60	$459.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	200%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
51	Cathedral	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
56	Dave Butler	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
58	Bill Cooper	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task cools the silicon.

M&S BOE-
NA

Labor BOE-
RunIIa and 2004 shudown experience forms the basis of estimate for effort.

1.5.2.12.4	**Silicon Cold and Ready for Technical Commissioning**	**Mon 5/15/06**	**Mon 5/15/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone- RunIIb silicon cooled and ready for technical commissioning.

1.5.2.13	**Technical commissioning of RunIIb Silicon**	**Mon 5/15/06**	**Tue 5/16/06**	**$0.00**	**$0.00**	**$379.60**	**$379.60**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This summary task operates silicon from control room, demonstrates its full operability.

1.5.2.13.1	Demonstrate Full Operability of all Channels from Control Roc	Mon 5/15/06	Tue 5/16/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
Electrical/connectivity integrity of the silicon is checked in this task.

M&S BOE-
NA

Labor BOE-
Run2a experience forms the basis of the estimates for labor.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.13.2	Demonstrate Full Operability of all Channels from Control Roc	Mon 5/15/06	Tue 5/16/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	400%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
Electrical/connectivity integrity of the silicon is checked in this task.

M&S BOE-
NA

Labor BOE-
Run2a experience forms the basis of the estimates for labor.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.13.3	Technical Commissioning of Silicon Completed	Tue 5/16/06	Tue 5/16/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone- RunIIb silicon technical commissioning completed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.14	Make Up Outer Beampipes, Leakcheck	Tue 5/16/06	Tue 5/23/06	$0.00	$0.00	$9,231.20	$9,231.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$1,898.00	$0.00	$0.00	$1,898.00	40 h	0 h	0 h	0 h	40 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
This summary task closes the detector, surveyes the EC, makes final leakcheck at SNEG's.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.14.1	Remove gap hardware, Close EC's, EF's, Remove Long L0 Tc	Tue 5/16/06	Wed 5/17/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
49	GapN	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
50	GapS	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h
51	Cathedral	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes gap access hardware, closes EC's, use locking bar to fix location of beampipe assembly with respect to EC's, closes EF's, makes work platform on S muon shield bridges, removes beampipe spacer and long tool from ECS pipe.

M&S BOE-
NA

Labor BOE-
RunIIa and 2004 shudown experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.14.2	Install SNEG pipes, leakcheck pipe assembly	Wed 5/17/06	Fri 5/19/06	$0.00	$0.00	$2,597.60	$2,597.60

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
40	SeniorMechTechF	400%	$1,838.40	$0.00	$0.00	$1,838.40	64 h	0 h	0 h	0 h	64 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes

WBS Definition-
This task installs S SNEG, bellows, cross and tee; adjusts bellows at cross if necessary, evacuates beam pipe via pump in tunnel; removes N spacer and purge; install N SNEG, cross and tee; adjusts bellows at cross if necessary; evacuates pipe at D1 quad; leakchecks pipe assembly; (if leak, must open EF's, remove pipe brace bars, open EC's, install gap hardware, remake inner joint).

M&S BOE-
NA

Labor BOE-
RunIIa and 2004 shudown experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.14.3	Survey Muon C Trusses	Wed 5/17/06	Fri 5/19/06	$0.00	$0.00	$919.20	$919.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
41	SurveyorF	200%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h

Notes

WBS Definition-
This task surveys the C-layer trusses

M&S BOE-
NA

Labor BOE-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Survey Muon C Trusses" continued							

Notes
RunIIa experience forms the basis of estimate for this task.

1.5.2.14.4	Activate SNEG's	Fri 5/19/06	Tue 5/23/06	$0.00	$0.00	$1,218.80	$1,218.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$759.20	$0.00	$0.00	$759.20	16 h	0 h	0 h	0 h	16 h
40	SeniorMechTechF	100%	$459.60	$0.00	$0.00	$459.60	16 h	0 h	0 h	0 h	16 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes
WBS Definition-
This task bakes out the SNEG pipes (24 hrs@110C, 24hrs@190C).

M&S BOE-
NA

Labor BOE-
2004 shudown experience forms the basis of estimate for effort.

1.5.2.14.5	Open EF's, Install BLM's	Fri 5/19/06	Mon 5/22/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes
WBS Definition-
This task retracts muon shield bridge arms into C truss and opens the EF irons; installs BLM's in EF irons and connects cables.

M&S BOE-
NA

Labor BOE-
RunIIa experience involving manipulation of EC's forms the basis of estimate.

1.5.2.15	**Close and Survey Detector for Operation**	**Mon 5/22/06**	**Tue 5/30/06**	**$0.00**	**$0.00**	**$8,776.70**	**$8,776.70**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,087.80	$0.00	$0.00	$2,087.80	44 h	0 h	0 h	0 h	44 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	44 h	0 h	0 h	0 h	44 h

Notes
WBS Definition-
This summary task closes the detector, surveyes the EC, makes final leakcheck at SNEG's.

1.5.2.15.1	Repair N A-Layer MDT, close & survey	Mon 5/22/06	Wed 5/24/06	$0.00	$0.00	$919.20	$919.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	200%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
41	SurveyorF	200%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h

Notes
WBS Definition-
This task opens N A PDT layer, repairs 3 broken wires, closes, then surveys A layer.

M&S BOE-
NA

Labor BOE-
RunIIa experience where this task was done more than once forms the basis of estimate.
Assume physicist do repairs at night so survey done the following day.

1.5.2.15.2	Survey EC's	Mon 5/22/06	Tue 5/23/06	$0.00	$0.00	$919.20	$919.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
41	SurveyorF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h

Notes
WBS Definition-
This task makes VSTAR survey of EC's.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.15.3	Close CF; close EF's	Wed 5/24/06	Thu 5/25/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task removes gap access hardware and closes CF's; closes EF's

M&S BOE-
NA

Labor BOE-
RunIIa experience involving manipulation of CF's and EF's forms the basis of estimate.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.15.4	Remove SNEG heaters, install FPD VETOes	Thu 5/25/06	Fri 5/26/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task extends muon shield arms and installs work platform; removes heat tapes from SNEGs, installs VETO counters on SNEGs.

M&S BOE-
NA

Labor BOE-
RunIIa experience involving manipulation of CF's and EF's forms the basis of estimate.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.15.5	Make EF, CF Stickmike survey	Thu 5/25/06	Thu 5/25/06	$0.00	$0.00	$344.70	$344.70

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
41	SurveyorF	300%	$344.70	$0.00	$0.00	$344.70	12 h	0 h	0 h	0 h	12 h

Notes

WBS Definition-
This task makes stickmike survey of CF's, EF's.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.15.6	Extend muon shielding, close clamshells	Fri 5/26/06	Fri 5/26/06	$0.00	$0.00	$1,298.80	$1,298.80

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h
40	SeniorMechTechF	400%	$919.20	$0.00	$0.00	$919.20	32 h	0 h	0 h	0 h	32 h
105	Jim Fagan	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task extends the muon shields, closes the clamshells.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.15.7	Survey detector centerbeam ends	Thu 5/25/06	Fri 5/26/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
This task makes VSTAR survey of centerbeam ends.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.2.15.8	Test magnet power supplies	Tue 5/30/06	Tue 5/30/06	$0.00	$0.00	$609.40	$609.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$379.60	$0.00	$0.00	$379.60	8 h	0 h	0 h	0 h	8 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Test magnet power supplies" continued							

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
40	SeniorMechTechF	100%	$229.80	$0.00	$0.00	$229.80	8 h	0 h	0 h	0 h	8 h
106	Mike Sarychev	100%	$0.00	$0.00	$0.00	$0.00	8 h	0 h	0 h	0 h	8 h

Notes

WBS Definition-
This task secures collision hall and exercises magnet power supplies.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate for effort. Will be done on night shift.

1.5.2.15.9	Detector Closed for Resumption of Tevatron	Tue 5/30/06	Tue 5/30/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone- RunIIb detector closed and ready for physics.

1.5.2.16	Commission Silicon Online Readout Software	Tue 5/16/06	Thu 5/25/06	$0.00	$0.00	$2,657.20	$2,657.20

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
39	SeniorMechEngF	100%	$2,657.20	$0.00	$0.00	$2,657.20	56 h	0 h	0 h	0 h	56 h
59	Russ Rucinski	100%	$0.00	$0.00	$0.00	$0.00	56 h	0 h	0 h	0 h	56 h

Notes

WBS Definition-
This task provides for the testing of the Online Readout Software, which includesthe unpacking software which facilitates the data transfer from electronic coordinates to physics coordinates, and the unpacking software for L3 and offline analysis. The majority of this software is taken from Run IIa and modified for use at SiDet for the 1% and 10% silicon test stands, prior to the start of the Run IIb shutdown.
The elapsed times for the tasks assume immediate access to the detector to resolve mapping, etc. If the Tevatron has resumed operations, the task durations dialate.

1.5.2.16.1	Verify functionality of all SMT software - Univ	Tue 5/16/06	Thu 5/25/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	400%	$0.00	$0.00	$0.00	$0.00	224 h	0 h	0 h	0 h	224 h

Notes

WBS Definition-
This task verifies the functionality of the monitoring and downloading software of all silicon crates,
data unpacking software (electronics to physics addressing), L3/offline software (Examine).

M&S BOE-
NA

Labor BOE-
This effort is primarily based on verifying the proper function of well-understood modifications made to the Run IIa software.

1.5.2.16.2	Verify functionality of all SMT software - FNAL	Tue 5/16/06	Thu 5/25/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	400%	$0.00	$0.00	$0.00	$0.00	224 h	0 h	0 h	0 h	224 h

Notes

WBS Definition-
This task verifies the functionality of the monitoring and downloading software of all silicon crates,
data unpacking software (electronics to physics addressing), L3/offline software (Examine).

M&S BOE-
NA

Labor BOE-
This effort is primarily based on verifying the proper function of well-understood modifications made to the Run IIa software.

1.5.2.16.3	Silicon System Ready for Physics Commissioning	Thu 5/25/06	Thu 5/25/06	$0.00	$0.00	$0.00	$0.00

Notes

WBS Definition-
Milestone-The RunIIb silicon system has been installed, technically commisioned, and is ready for physics commissioning.

1.5.3	Run IIb Trigger Installation & Technical Commissioning	Tue 1/4/05	Tue 8/1/06	$75,500.00	$0.00	$334,476.00	$409,976.00

Notes

WBS Definition-
The Run IIb trigger upgrade includes upgrades to three systems - the Level 1 calorimeter trigger, a calorimeter cluster track match at Level 1, and the Level 1 central track trigger, as well as upgrades to the Level 2 beta processors and the Level 2 Silicon Track Trigger. This summary WBS element includes the effort required to install and initially commission these trigger upgrades.

1.5.3.1	Prepare Infrastructure at DAB	Tue 1/4/05	Fri 5/5/06	$0.00	$0.00	$15,088.00	$15,088.00

Notes

WBS Definition-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Prepare Infrastructure at DAB" continued

Notes

This summary task includes activities that must take place to ensure that all infrastructure components required for the Run IIb trigger (Cal L1 racks, Cal BLS cables, L1 Cal/Track Match crates, boards, and cables) are in hand prior to shutdown.

1.5.3.1.3 Make Muon PDT and SFE Mods for CTM — Tue 1/4/05 — Tue 3/1/05 — $0.00 — $0.00 — $15,088.00 — $15,088.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	10%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	24 h	8 h
37	SeniorElecEngF	100%	$15,088.00	$0.00	$11,316.00	$3,772.00	320 h	0 h	0 h	240 h	80 h
86	Sten Hansen	100%	$0.00	$0.00	$0.00	$0.00	320 h	0 h	0 h	240 h	80 h
87	Tom Fitzpatrick	50%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	120 h	40 h
92	Al Ito	10%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	24 h	8 h

Notes

WBS Definition-
Develop and demonstrate modification of muon PDT frontends for pipeline extension, and firmware for Scintillator front ends.

M&S BOE -
NA

Labor BOE - Run2a muon Level 1 experience with PDT board maintenance & development. Sten Hansen develops PDT board change at "mini", Al Ito proves R&D board (s) performance in detector. Tom Fitzpatrick develops Scintillator Firmware.

1.5.3.1.4 Develop CTM Operating Software-Arizona — Fri 7/22/05 — Tue 4/25/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	800 h	0 h	0 h	76 h	724 h

Notes

WBS Definition-
Develop software required to operate CTM: modify Vxworks (processor, L1CTM flavor,..); add L1CTM to cold-start GUI, to input GUI, to parity-check GUI, to mtm-term GUI, power supply GUI, RM/RMI GUI, comics notebook GUI; develop Quicktest/quickcheck script; COOR trigger terms download; add L1CTM to online simulator-hardware comparison code, to online efficiency code; generate first-pass trigger logic (e.g. BOT, L1CTT-only, L1Cal-only, L1CTT and L1Cal for electrons, taus, jets); online web pages and documentation;
Develop offline software: read L1CTM from RDS, TMB; tsim_L1caltrack; L1caltrack_analyze(unpacker); L1L2_evt (into TMB); examine; documentation

M&S BOE- NA

Labor BOE- two physicists working full time. Effort not managed by Upgrade Project.

1.5.3.1.5 Develop CTM Operating Software-FNAL — Fri 7/22/05 — Tue 4/25/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	800 h	0 h	0 h	76 h	724 h

Notes

WBS Definition-
Develop software required to operate CTM: modify Vxworks (processor, L1CTM flavor,..); add L1CTM to cold-start GUI, to input GUI, to parity-check GUI, to mtm-term GUI, power supply GUI, RM/RMI GUI, comics notebook GUI; develop Quicktest/quickcheck script; COOR trigger terms download; add L1CTM to online simulator-hardware comparison code, to online efficiency code; generate first-pass trigger logic (e.g. BOT, L1CTT-only, L1Cal-only, L1CTT and L1Cal for electrons, taus, jets); online web pages and documentation;
Develop offline software: read L1CTM from RDS, TMB; tsim_L1caltrack; L1caltrack_analyze(unpacker); L1L2_evt (into TMB); examine; documentation

M&S BOE- NA

Labor BOE- two physicists working full time. Effort not managed by Upgrade Project. Share with U as soon as U specified.

1.5.3.1.7 Preliminary Commissioning of L1 CTT elements-Upgrade — Wed 1/19/05 — Thu 9/15/05 — $0.00 — $0.00 — $0.00 — $0.00

Notes

WBS Definition-
This task provides for the precommissioning of DFEB's (new DFEA backplane and crate controller also) as they become available. All operating software -- PS control for DFEB crates, raw ethernet driver, raw ethernet serializer, DFEB boards added to dfe_ware database, download interface for DFEB to dfe_ware,...is verified during these tests.

M&S BOE-
NA

Labor BOE- None. All effort provided by Upgrade Project.

1.5.3.1.8 Preliminary Commissioning of L1 CTM elements-Arizona — Wed 11/30/05 — Tue 4/25/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	50%	$0.00	$0.00	$0.00	$0.00	400 h	0 h	0 h	0 h	400 h

Notes

WBS Definition-
This task provides for the installation of L1MU trigger and crate manager cards in new L1 CTM crate installed in MCH1, begin the technical commissioning of L1 CTM (BOT triggers to TFW, etc.) then replace with production L1 CTM trigger and crate manager cards as they become available.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Preliminary Commissioning of L1 CTM elements-Arizona" continued							

Notes

Labor BOE-
Two university physicists working half time are required for this task. Task duration extends until last hardware component of L1 CTM is installed in MCH1.

1.5.3.1.9	Preliminary Commissioning of L1 CTM elements-FNAL	Wed 11/30/05	Tue 4/25/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	400 h	0 h	0 h	0 h	400 h

Notes

WBS Definition-
This task provides for the installation of L1MU trigger and crate manager cards in new L1 CTM crate installed in MCH1, begin the technical commissioning of L1 CTM (BOT triggers to TFW, etc.) then replace with production L1 CTM trigger and crate manager cards as they become available.

M&S BOE-
NA

Labor BOE-
Two university physicists working half time are required for this task. Task duration extends until last hardware component of L1 CTM is installed in MCH1.

1.5.3.1.10	**Prepare Safety and PORC documentation**	**Mon 6/20/05**	**Fri 7/1/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task prepares necessary PORCs ("Partial Operational Readiness Clearance") safety documentation for unattended operation of new hardware for trigger upgrade.

1.5.3.1.10.1	Prepare PORC for L1CTM Crates - FNAL	Mon 6/20/05	Fri 7/1/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
55	Linda Bagby	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
This task provides effort for the preparation of the safety documentation and PORC, including "walk-thrus" required for permission to operate the system, for the L1CTM crates in MCH1. The primary emphasis of the pORC is that of the boards; the crate and installation are not novel.

M&S BOS-
None.

Labor BOE-
Based on RunIIa experience and considering that review/updating of existing documentation constitutes the bulk of the task, one week time by an electrical engineer, and physicist are required for this task. Jeff Temple and John Anderson are the preferred personnel.

1.5.3.1.10.2	Prepare PORC for L1CTM Crates - UAZ	Mon 6/20/05	Fri 7/1/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
84	Jeff Temple	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
This task provides effort for the preparation of the safety documentation and PORC, including "walk-thrus" required for permission to operate the system, for the L1CTM crates in MCH1. The primary emphasis of the pORC is that of the boards; the crate and installation are not novel.

M&S BOS-
None.

Labor BOE-
Based on RunIIa experience and considering that review/updating of existing documentation constitutes the bulk of the task, one week time by an electrical engineer, and physicist are required for this task. Jeff Temple and John Anderson are the preferred personnel.

1.5.3.1.10.3	**Trigger Safety and PORC Documentation Completed**	**Fri 7/1/05**	**Fri 7/1/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone- Trigger safety and PORC documentation prepared.

1.5.3.1.11	**Trigger Infrastructure Prepared**	**Fri 7/1/05**	**Fri 7/1/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone- Trigger Infrastructure tasks completed. Included are: completion of L1 Cal Trigger racks for MCH1; preliminary commissioning of all Cal Trig elements in test stand on the DAB1 sidewalk; the planning for the rerouting of the Cal BLS cables in MCH1; the iinstallation of the Cal-Trk VME crate and the Cal Track Match Crate and power supplies in MCH1; the CalTrackMatch splitter crate, rack, and rack services,on the platform; and install the MTCxx and MTCM electronics in the crate;

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.1.12	**Make all Necessary Detector Repairs**	**Thu 3/9/06**	**Fri 5/5/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
This summary task facilitates planning for detector maintenance activities during the shutdown.

1.5.3.1.12.1	AFEII Stuff	Thu 3/9/06	Thu 4/6/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
This task is a placeholder to accommodate AFEII needs during the shutdown.

M&S BOE-
NA

Labor BOE-
NA

1.5.3.1.12.2	Detector Repair and Maintenance	Thu 3/9/06	Thu 5/4/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
This task is a placeholder to accommodate detector maintenance needs during the shutdown.

M&S BOE-
NA

Labor BOE-
NA

1.5.3.1.12.3	Cal Maintenance	Fri 3/10/06	Fri 5/5/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
This task is a placeholder to accommodate calorimeter needs during the shutdown.

M&S BOE-
NA

Labor BOE-
NA

1.5.3.1.12.4	**Detector Repaired for Resumption of Physics**	**Fri 5/5/06**	**Fri 5/5/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
Milestone- Detector repairs completed.

1.5.3.2	**Level 1 Calorimeter Trigger**	**Thu 9/15/05**	**Tue 8/1/06**	**$73,000.00**	**$0.00**	**$265,763.50**	**$338,763.50**

Notes
WBS Definition-
This summary element covers the Level 1 calorimeter trigger modifications. It includes development and procurement of ADC/digital filter boards (ADF), development and procurement of trigger-algorithm boards (TAB), the provision of output signals to facilitate a match between calorimeter towers and tracks, and procurement and improvements in associated readout crates, power supplies, cabling, and controls hardware.

1.5.3.2.1	**L1 Cal Installation And Technical Commissioning**	**Thu 9/15/05**	**Tue 8/1/06**	**$73,000.00**	**$0.00**	**$265,763.50**	**$338,763.50**

Notes
WBS Definition-
This summary task describes the installation of the new calorimeter trigger in the DZero moveable counting house.

1.5.3.2.1.1	Engineering and Computer Professional Support - FNAL	Thu 9/15/05	Tue 8/1/06	$0.00	$0.00	$216,744.00	$216,744.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
13	*CompProfF*	*200%*	*$133,760.00*	*$0.00*	*$0.00*	*$133,760.00*	*3,520 h*	*0 h*	*0 h*	*0 h*	*3,520 h*
37	*SeniorElecEngF*	*100%*	*$82,984.00*	*$0.00*	*$0.00*	*$82,984.00*	*1,760 h*	*0 h*	*0 h*	*0 h*	*1,760 h*

Notes
WBS Definition-
This task provides for the support of two computing professionals and one electrical engineer full time for oversight, consultation and testing/monitoring software tasks during trigger installation effort.

M&S BOE-
NA

Labor BOE-
Run IIa experience forms the basis of this estimate. Jamieson Olson is the preferred electrical engineer.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.2.1.2	Engineering Support - MSU	Thu 9/15/05	Tue 8/1/06	$72,000.00	$0.00	$0.00	$72,000.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
44	SeniorElecEngU	200%	$0.00	$0.00	$0.00	$0.00	3,520 h	0 h	0 h	0 h	3,520 h
48	MandS	72,000	$72,000.00	$0.00	$0.00	$72,000.00	72,000		0	0	72,000
77	Dan Edmunds	100%	$0.00	$0.00	$0.00	$0.00	1,760 h	0 h	0 h	0 h	1,760 h
78	Phillipe Laurens	100%	$0.00	$0.00	$0.00	$0.00	1,760 h	0 h	0 h	0 h	1,760 h

Notes

WBS Definition-
This task provides for the support of two university engineers (D. Edmunds, Phillipe Laurens) full time for oversight, consultation and testing/monitoring tasks during trigger installation effort.

M&S BOE-
Sufficient M&S for the support of the University engineers for the duration of the project, starting when L1Cal Trig fabrication is completed.

Labor BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.2.1.3	**Integrate L1Cal Operation into Physics Runs**	**Wed 11/23/05**	**Wed 11/23/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	0 h	0 h	0 h	0 h	0 h

Notes

WBS Definition-
Milestone - L1Cal Upgrade "Sidewalk" system integrated into Global Physics Runs in Control Room -- data from system flows to L3 for offline study under control of DAQ and monitored by CalMuon shifters

M&S BOE-
NA

Labor BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.2.1.4	Final Cal Noise Studies	Fri 3/10/06	Mon 3/13/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	200%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes

WBS Definition-
This task completes the noise studies in the Cal, prior to and just after the beam pipe is parted.

M&S BOE-
NA

Labor BOE-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.2.1.5	Decable BLS cables from Trigger Crates	Mon 3/13/06	Mon 3/20/06	$0.00	$0.00	$943.00	$943.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	30%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
12	PhysicistU	400%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
37	SeniorElecEngF	50%	$943.00	$0.00	$0.00	$943.00	20 h	0 h	0 h	0 h	20 h
55	Linda Bagby	30%	$0.00	$0.00	$0.00	$0.00	12 h	0 h	0 h	0 h	12 h
72	John Anderson	50%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
75	Alan Stone	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
Decable present 1280 BLS cables from Cal Trig Racks: add new label to each cable, dress bundles aside in plastic cableway.

M&S BOE-
NA

Labor BOE-
Detailed estimate by A. Stone of labor involved: 1280 BLS cables in 10 racks means 128 cables per rack. Cables in rack come in 32 bundles (4 cables per bundle). Two persons would work as a team, will be able to do 2 racks per day (256 cables). Two teams can work in MCH1 at a time. Elapsed time: 2.5 days

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.2.1.6	Depopulate and remove trigger crates	Mon 3/20/06	Mon 4/3/06	$0.00	$0.00	$11,486.00	$11,486.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
37	SeniorElecEngF	50%	$1,886.00	$0.00	$0.00	$1,886.00	40 h	0 h	0 h	0 h	40 h
38	SeniorElecTechF	400%	$9,600.00	$0.00	$0.00	$9,600.00	320 h	0 h	0 h	0 h	320 h
72	John Anderson	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
100	Mike Cherry	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
101	Bruce Merkel	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
102	Victor Martinez	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
103	Ben Abraham	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Depopulate and remove trigger crates" continued

Notes

WBS Definition-
This task removes boards from trigger crates after BLS cables removed, then removes crates from racks. The crates need not be recovered for service after removal.
Power supplies and heat exchangers in the racks will also be removed during this task. Existing airflow ductwork at the top of the racks will likely not need to be removed.

M&S BOE-
NA

Labor BOE-
Detailed estimate by A. Stone. Two persons working as a team can depopulate and remove crates in 1 rack per day. Two teams can fit in MCH1. Elapsed time: 10 days.

1.5.3.2.1.7	Install Rack Infrastructure in active racks	Mon 3/27/06	Mon 4/17/06	$1,000.00	$0.00	$21,092.10	$22,092.10

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
37	SeniorElecEngF	100%	$5,658.00	$0.00	$0.00	$5,658.00	120 h	0 h	0 h	0 h	120 h
38	SeniorElecTechF	400%	$14,400.00	$0.00	$0.00	$14,400.00	480 h	0 h	0 h	0 h	480 h
40	SeniorMechTechF	30%	$1,034.10	$0.00	$0.00	$1,034.10	36 h	0 h	0 h	0 h	36 h
48	MandS	1,000	$1,000.00	$0.00	$0.00	$1,000.00	1,000		0	0	1,000
69	John Fogelsong	50%	$0.00	$0.00	$0.00	$0.00	60 h	0 h	0 h	0 h	60 h
72	John Anderson	50%	$0.00	$0.00	$0.00	$0.00	60 h	0 h	0 h	0 h	60 h
100	Mike Cherry	100%	$0.00	$0.00	$0.00	$0.00	120 h	0 h	0 h	0 h	120 h
101	Bruce Merkel	100%	$0.00	$0.00	$0.00	$0.00	120 h	0 h	0 h	0 h	120 h
102	Victor Martinez	100%	$0.00	$0.00	$0.00	$0.00	120 h	0 h	0 h	0 h	120 h
103	Ben Abraham	100%	$0.00	$0.00	$0.00	$0.00	120 h	0 h	0 h	0 h	120 h

Notes

WBS Definition-
This involves outfitting 4 of the existing racks with water supply, heat exchangers, air blowers, 1553's, RMI's, smoke and drip detectors, Pulizzi boxes (all items taken from existing spares or new units). Duct work on top of racks is involved.

M&S BOE-
Estimate $200 per rack additional small parts required.

Labor BOE-
Experience installing racks for Run1 forms the basis of estimate. Four persons can complete the four racks in one week.

1.5.3.2.1.8	Install Patch Panels in Passive Racks, reconnect BLS cables	Mon 4/17/06	Mon 4/24/06	$0.00	$0.00	$4,286.00	$4,286.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
37	SeniorElecEngF	100%	$1,886.00	$0.00	$0.00	$1,886.00	40 h	0 h	0 h	0 h	40 h
38	SeniorElecTechF	200%	$2,400.00	$0.00	$0.00	$2,400.00	80 h	0 h	0 h	0 h	80 h
55	Linda Bagby	50%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
69	John Fogelsong	50%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
72	John Anderson	50%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
75	Alan Stone	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
101	Bruce Merkel	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
102	Victor Martinez	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
Installs 32 BLS patch panels in racks (techs), reconnect 1280 BLS cables(physicists).

M&S BOE-
NA

Labor BOE-
Estimate by A. Stone based on mockup work on sidewalk: one person can do 1 rack per day (128 cables), 10 racks involved.

1.5.3.2.1.9	Install ADF, TAB/GAB, Readout, Controller Crates	Mon 4/17/06	Mon 5/1/06	$0.00	$0.00	$8,572.00	$8,572.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
37	SeniorElecEngF	100%	$3,772.00	$0.00	$0.00	$3,772.00	80 h	0 h	0 h	0 h	80 h
38	SeniorElecTechF	200%	$4,800.00	$0.00	$0.00	$4,800.00	160 h	0 h	0 h	0 h	160 h
69	John Fogelsong	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
72	John Anderson	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
75	Alan Stone	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
103	Ben Abraham	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
104	Joshua Moua	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
Remove four TT crates from sidewalk racks, transport to MCH1, install in MCH1 racks. Ditto for TAB/GAB, readout, and controller crates. Includes TAB/GAB powersupply.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install ADF, TAB/GAB, Readout, Controller Crates" continued

Notes

Labor BOE-
A. Stone estimate: two technicians will do 1 crate per day.

1.5.3.2.1.10	Connect Pleated Foil Cables	Wed 4/19/06	Fri 4/28/06	$0.00	$0.00	$2,640.40	$2,640.40

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	28 h	0 h	0 h	0 h	28 h
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	112 h	0 h	0 h	0 h	112 h
37	SeniorElecEngF	100%	$2,640.40	$0.00	$0.00	$2,640.40	56 h	0 h	0 h	0 h	56 h
55	Linda Bagby	50%	$0.00	$0.00	$0.00	$0.00	28 h	0 h	0 h	0 h	28 h
75	Alan Stone	100%	$0.00	$0.00	$0.00	$0.00	56 h	0 h	0 h	0 h	56 h
85	Johnny Green	100%	$0.00	$0.00	$0.00	$0.00	56 h	0 h	0 h	0 h	56 h

Notes

WBS Definition-
Labael and connect pleated foil cables (40 per TT crate) from BLS patch panels.

M&S BOE-
NA

Labor BOE-
Taken from cabling of the L2muon trigger system; one person can do 20 per day.

1.5.3.2.1.11	Connect ADF -- TAB/GAB and TFW cables	Mon 5/1/06	Wed 5/3/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	32 h	0 h	0 h	0 h	32 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h
75	Alan Stone	100%	$0.00	$0.00	$0.00	$0.00	16 h	0 h	0 h	0 h	16 h

Notes

WBS Definition-
Connect the 61 cables per ADF (3x20 LVDS + 1), controller and readout cables.

M&S BOE-
NA

Labor BOE-
Estimate 1 person can cable one ADF crate per day.

1.5.3.2.1.12	**L1 Cal Ready for Technical Commissioning**	**Wed 5/3/06**	**Wed 5/3/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone- All L1 Cal components are installed in MCH1.

1.5.3.2.1.13	Technical commissioning in MCH1-UIC & CU	Wed 5/3/06	Wed 5/24/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	300%	$0.00	$0.00	$0.00	$0.00	360 h	0 h	0 h	0 h	360 h
96	Sabaine Lammers	100%	$0.00	$0.00	$0.00	$0.00	120 h	0 h	0 h	0 h	120 h

Notes

WBS Definition-
Operate full system in MCH1, verify cabling, check L1, L2, L3 data, calibrate the Trigger Towers, compare TT and precision readout, develop final ADF coefficients, study debug triggers. Because all racks have been operated in the DAB1 test area, possible malfunction due to the relocation to the MCH1 einvironment is not likely. Tevatron collisions assumed for at least part of period, but operation with cosmics, pulsers also likely.

M&S BOE-
NA

Labor BOE-
Estimated by people who built existing cal L1. As university/FNAL division of labor becomes defined, specific personnel and Universities will be identified.

1.5.3.2.1.14	Technical commissioning in MCH1-FNAL	Wed 5/3/06	Wed 5/24/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	300%	$0.00	$0.00	$0.00	$0.00	360 h	0 h	0 h	0 h	360 h
55	Linda Bagby	100%	$0.00	$0.00	$0.00	$0.00	120 h	0 h	0 h	0 h	120 h

Notes

WBS Definition-
Operate full system in MCH1, verify cabling, check L1, L2, L3 data, calibrate the Trigger Towers, compare TT and precision readout, develop final ADF coefficients, study debug triggers. Because all racks have been operated in the DAB1 test area, possible malfunction due to the relocation to the MCH1 einvironment is not likely. Tevatron collisions assumed for at least part of period, but operation with cosmics, pulsers also likely.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Technical commissioning in MCH1-FNAL" continued							

Notes

Labor BOE-
Estimated by people who built existing cal L1. As university/FNAL division of labor becomes defined, specific personnel and Universities will be identified.

1.5.3.2.1.15	**Level 1 Cal Trigger Installed & Technical Commissioning (**	**Tue 6/6/06**	**Tue 6/6/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-The level 1 calorimeter trigger has been installed and technically commissioned, so that it is ready for beam in the detector.

1.5.3.3	**Level 1 Calorimeter Track Matching**	**Thu 9/15/05**	**Thu 6/8/06**	**$2,000.00**	**$0.00**	**$0.00**	**$2,000.00**

Notes

WBS Definition-
This summary element provides for improvements in the Run2a track-matching trigger. It includes development and procurement of slightly modified versions of existing Level 1 muon cards, and procurement of related cabling, connectors, readout crates, processors, and power supplies.

1.5.3.3.1	**L1 Cal/Track Match Production and Testing Completed**	**Thu 9/15/05**	**Thu 9/15/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-All production and testing for the cal/track match has been done.

1.5.3.3.2	**L1 Cal/Trk Match Installation**	**Thu 9/15/05**	**Wed 10/12/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task describes the installation of the complete cal-track matching system in the experiment.

1.5.3.3.2.1	Install Production L1 CTM electronics in MCH	Thu 9/15/05	Wed 10/12/05	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*100%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*160 h*	*0 h*	*0 h*	*0 h*	*160 h*

Notes

WBS Definition-
Install MTCxx, MTFB, and MTCM in crate and connect cables (need ~30 cables from L1Cal trig and L1Cal trk) and do final cable dressing. Work to be completed prior to RunIIb shutdown.

Labor BOE-
Experience installing Level 1 muon trigger cards in Run 2a. Assumes two physicists at 50% FTE each.

1.5.3.3.2.2	**L1 Cal/Track Match Installed in MCH**	**Wed 10/12/05**	**Wed 10/12/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-MCH portion of CTM installed.

1.5.3.3.3	**L1 Cal/Trk Match Technical Commissioning**	**Thu 10/13/05**	**Thu 6/8/06**	**$2,000.00**	**$0.00**	**$0.00**	**$2,000.00**

Notes

WBS Definition-
This summary task describes the technical commissioning of the cal-track matching system in the experiment. It begins shortly after the run resumes using muon trigger cards after the 2004 shutdown, and continues until production L1Caltrk cards are available.

1.5.3.3.3.1	Debug timing and trigger signals from the TFW	Thu 10/13/05	Wed 10/26/05	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*200%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*160 h*	*0 h*	*0 h*	*0 h*	*160 h*

Notes

WBS definition -
Verify that the cal-trk trigger is receiving proper timing (BOT) and trigger signals from the trigger framework. Production crate managers will be on hand early 2005.

M&S BOE -
No M&S associated with this task

Labor BOE -
Requires full electronics chain (trigger framework, serial command link hub, muon fanout card, muon readout card) to be available. In run 2a, this took approximately 4 months, but much more of the infrastructure will be in place and tested at the time of the Run IIb task: 1 month of physicist time.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.3.3.2	Establish L2, L3 readout	Thu 10/27/05	Wed 11/23/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Record data sent to L2 and L3 and verify format.
done before shutdown!

M&S BOE-
NA

Labor BOE-
RunIIa experience establishing readout of L2 and L3 data from Level 1 muon trigger: 1 physicist full time for a month.

I

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.3.3.3	Make L1 latency change	Wed 3/1/06	Fri 3/3/06	$2,000.00	$0.00	$0.00	$2,000.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
44	SeniorElecEngU	100%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h
48	MandS	2,000	$2,000.00	$0.00	$0.00	$2,000.00	2,000		0	0	2,000
77	Dan Edmunds	100%	$0.00	$0.00	$0.00	$0.00	20 h	0 h	0 h	0 h	20 h

Notes

WBS Definition-
Install L1 total latency change in TFW

M&S BOE-
NA

Labor BOE-
RunIIa experience; Dan Edmunds. Estimate $2000.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.3.3.4	Debug CTM decision to TFW	Fri 3/3/06	Fri 3/10/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
Verify timing of cal-track match is correct at the trigger framework.
old "decisions" being done now.

M&S BOE-
NA

Labor BOE-
RunIIa experience verifying Level 1 muon trigger decisions: 1 week for a physicist.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.3.3.5	**L1 CTM Ready for Final Technical Commissioning**	**Wed 5/24/06**	**Wed 5/24/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-L1CTM ready for final Technical Commissioning.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.3.3.6	Debug input from all sources	Wed 5/24/06	Thu 6/8/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Verify inputs from CTT, cal-L1
* note - relies on CTT and cal-L1 being ready to send outputs -- need at least 1/8 of Cal L1.
data quality not critical, just so it comes.

M&S BOE-
NA

Labor BOE-
RunIIa muon Level 1 experience debugging inputs from muon front ends and CTT: 1 full time physicist for a month.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.3.3.7	**Level 1 Cal/Track Match Technical Commissioning Compl**	**Thu 6/8/06**	**Thu 6/8/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-The level 1 calorimeter track matching trigger has been technically commissioned.

In Run2a, the equivalent system tests for Level 1 muon trigger took six months with three physicists (full time). The cal-trk trigger is expected to go faster because it is approximately one sixth the size, and the L1 Muon trigger is by now well understood.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.4	**Modify Muon Pipeline Depth**	**Thu 3/9/06**	**Tue 6/27/06**	**$0.00**	**$0.00**	**$11,486.00**	**$11,486.00**

Notes

WBS Definition-
This summary element provides for modifications to muon electronics required by the upgrade.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.4.1	Remove Muon PDT front ends	Thu 3/9/06	Thu 3/16/06	$0.00	$0.00	$1,886.00	$1,886.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
37	SeniorElecEngF	100%	$1,886.00	$0.00	$0.00	$1,886.00	40 h	0 h	0 h	0 h	40 h
86	Sten Hansen	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
97	Penny Kasper	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
This task removes 94 (minus a few already prepared during 2005 running) muon PDT frontends.

M&S BOE-
NA

Labor BOE-
RunIIa experience from muon frontend maintenance: 3 boards per hour per physicist to remove (two physicists one week). Time to remove ~18 mods for A-layer will be paced by access time in cathedral, avoiding L0 installation work. L

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.4.2	Modify Muon PDT front ends	Fri 3/10/06	Fri 3/24/06	$0.00	$0.00	$9,600.00	$9,600.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
38	SeniorElecTechF	400%	$9,600.00	$0.00	$0.00	$9,600.00	320 h	0 h	0 h	0 h	320 h

Notes

WBS Definition-
This task changes components (~ 2 per board) on 94 muon front ends for increased pipeline depth.

M&S BOE-
NA

Labor BOE-
RunIIa experience from muon frontend maintenance: 3 hours per board bench work (4 technicians do boards in 80 hours).

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.4.3	Reinstall Muon PDT front ends	Tue 3/21/06	Tue 3/28/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
44	SeniorElecEngU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
86	Sten Hansen	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
97	Penny Kasper	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes

WBS Definition-
This task reinstalls 94 (minus a few already prepared during 2005 running) muon PDT frontends after they are modified.

M&S BOE-
NA

Labor BOE-
RunIIa experience from muon frontend maintenance: 2 boards per hour per physicist to reinstall in detector (two physicists one week). Time to install ~18 boards for A-layer will be paced by access time in cathedral, avoiding L0 installation work. Likely 2nd shift will be used for this part of task.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.4.4	Retime Muon PDT System	Wed 5/31/06	Tue 6/27/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	200%	$0.00	$0.00	$0.00	$0.00	320 h	0 h	0 h	0 h	320 h
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	320 h	0 h	0 h	0 h	320 h

Notes

WBS Definition-
This task re-times the muon pdt system after the pipeline depth change. Most of work must occur after return of beam.

M&S BOE-
NA

Labor BOE-
RunIIa experience forms the basis of estimate.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.4.5	**Muon Mods Complete**	**Tue 6/27/06**	**Tue 6/27/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-Muon pipeline depths modifications completed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.5	**L1 Central Track Trigger**	**Wed 3/8/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$37,720.00**	**$37,720.00**

Notes

WBS Definition-
This summary element provides for improvements in the existing track trigger. It includes design and development of algorithms that utilize larger FPGAs, and development and procurement of new Digital Front-End (DFE) boards that utilize these FPGAs.

1.5.3.5.1	**Installation And Technical Commissioning**	**Wed 3/8/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$37,720.00**	**$37,720.00**

Notes

WBS Definition-
This summary task provides for the shared installation effort of all the DFEA's for the new Central Track Trigger.

1.5.3.5.1.1	**Fermilab Contribution**	**Wed 3/8/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$37,720.00**	**$37,720.00**

Notes

WBS Definition-
This summary task provides for the shared installation effort of all the DFEA's for the new Central Track Trigger.

1.5.3.5.1.1.1	Install DFEA boards	Wed 3/8/06	Wed 3/22/06	$0.00	$0.00	$7,544.00	$7,544.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
37	SeniorElecEngF	200%	$7,544.00	$0.00	$0.00	$7,544.00	160 h	0 h	0 h	0 h	160 h
79	Jamieson Olson	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h
80	Stefan Grunendahl	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h
82	Stefano Rapisarda	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
Remove old crates (in rack PC03 on platform), install 2 new crates, hookup 320 input and 80 output cables, load DFEB boards in crates (40 boards total).

Labor BOE-
Steve Linn and Stefano Rapisarda (Eng) and Stefan Grunendahl -- 2 weeks effort.

M&S BOE-
NA

1.5.3.5.1.1.2	Debug all Inputs	Wed 3/22/06	Wed 4/19/06	$0.00	$0.00	$15,088.00	$15,088.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
37	SeniorElecEngF	200%	$15,088.00	$0.00	$0.00	$15,088.00	320 h	0 h	0 h	0 h	320 h
79	Jamieson Olson	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
80	Stefan Grunendahl	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
82	Stefano Rapisarda	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Verify inputs from AFE, SCL. (Caution if AFEII is in picture!). Need trigger framework/clock.

M&S BOE-
NA

Labor BOE-
Run2a CTT experience taking into account the fact that all DFEA have been previously operated in parallel test stand, performed by physicists. Engineers play consulting role. Time can readily extend to two months if AFEII iterations needed.

1.5.3.5.1.1.3	Verify Outputs	Wed 4/19/06	Wed 5/17/06	$0.00	$0.00	$15,088.00	$15,088.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
37	SeniorElecEngF	200%	$15,088.00	$0.00	$0.00	$15,088.00	320 h	0 h	0 h	0 h	320 h
79	Jamieson Olson	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
80	Stefan Grunendahl	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
82	Stefano Rapisarda	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Verify ouputs to L1 Muon, L2, L3, using test vectors. Can use separate clock if AFE's not available.

Labor BOE-
Run2a CTT experience taking into account all DFEA previously operated in parallel test stand, performed by physicists. Consult with engineers.

1.5.3.5.1.2	**Boston U Contribution**	**Wed 3/8/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task provides for the shared installation effort of all the DFEA's for the new Central Track Trigger.

1.5.3.5.1.2.1	Install DFEA boards	Wed 3/8/06	Wed 3/22/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install DFEA boards" continued

Notes

WBS Definition-
Remove old crates (in rack PC03 on platform), install 2 new crates, hookup 320 input and 80 output cables, load DFEB boards in crates (40 boards total).

Labor BOE-
2 weeks effort.

M&S BOE-
NA

WBS Definition-
Install new DFEA boards on the run 2a DFE motherboards. (Boards can be installed on Tev-off days during RunIIa -- final production of boards is scheduled to begin in March, 2005), but time is allowed after the beginning of the RunIIb shutdown to install all boards.

Labor BOE-
It will take about 16 man-days to install all 80 boards in the L1 CTT racks in the platform.

M&S BOE-
NA

1.5.3.5.1.2.2	Debug all Inputs	Wed 3/22/06	Wed 4/19/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*200%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*320 h*	*0 h*	*0 h*	*0 h*	*320 h*

Notes

WBS Definition-
Verify inputs from AFE, SCL.

M&S BOE-
NA

Labor BOE-
Run2a CTT experience taking into account the fact that all DFEA have been previously operated in parallel test stand, performed by physicists. Consult with engineers.

WBS Definition-
Verify inputs from AFE, SCL.

Labor BOE-
Run2a CTT experience, performed by physicists. Consult with engineers.

1.5.3.5.1.2.3	Verify Outputs	Wed 4/19/06	Wed 5/17/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*200%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*320 h*	*0 h*	*0 h*	*0 h*	*320 h*

Notes

WBS Definition-
Verify ouputs to L1 Muon, L2, L3 using test vectors.

Labor BOE-
Run2a CTT experience taking into account all DFEA previously operated in parallel test stand, performed by physicists, performed by physicists. Consult with engineers.

1.5.3.5.1.3	**Notre Dame Contribution**	**Wed 3/8/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task provides for the shared installation effort of all the DFEA's for the new Central Track Trigger.

1.5.3.5.1.3.1	Install DFEA boards	Wed 3/8/06	Wed 3/22/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*100%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*80 h*	*0 h*	*0 h*	*0 h*	*80 h*

Notes

WBS Definition-
Remove old crates (in rack PC03 on platform), install 2 new crates, hookup 320 input and 80 output cables, load DFEB boards in crates (40 boards total).

Labor BOE-
2 weeks effort.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Install DFEA boards" continued

Notes

M&S BOE-
NA

WBS Definition-
Install new DFEA boards on the run 2a DFE motherboards. (Boards can be installed on Tev-off days during RunIIa -- final production of boards is scheduled to begin in March, 2005), but time is allowed after the beginning of the RunIIb shutdown to install all boards.

Labor BOE-
It will take about 16 man-days to install all 80 boards in the L1 CTT racks in the platform.

M&S BOE-
NA

1.5.3.5.1.3.2	Debug all Inputs	Wed 3/22/06	Wed 4/19/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Verify inputs from AFE, SCL.

M&S BOE-
NA

Labor BOE-
Run2a CTT experience taking into account the fact that all DFEA have been previously operated in parallel test stand, performed by physicists. Consult with engineers. Time can readily extend to two months if AFEII iterations needed.

1.5.3.5.1.3.3	Verify Outputs	Wed 4/19/06	Wed 5/17/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Verify ouputs to L1 Muon, L2, L3

Labor BOE-
Run2a CTT experience taking into account all DFEA previously operated in parallel test stand, performed by physicists, performed by physicists. Consult with engineers.

1.5.3.5.1.4	**KU Contribution**	**Wed 3/8/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task provides for the shared installation effort of all the DFEA's for the new Central Track Trigger.

1.5.3.5.1.4.1	Install DFEA boards	Wed 3/8/06	Wed 3/22/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
Remove old crates (in rack PC03 on platform), install 2 new crates, hookup 320 input and 80 output cables, load DFEB boards in crates (40 boards total).

Labor BOE-
2 weeks effort.

M&S BOE-
NA

1.5.3.5.1.4.2	Debug all Inputs	Wed 3/22/06	Wed 4/19/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h
44	SeniorElecEngU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Debug all Inputs" continued

Notes

Verify inputs from AFE, SCL.

M&S BOE-
NA

Labor BOE-
Run2a CTT experience taking into account the fact that all DFEA have been previously operated in parallel test stand, performed by physicists. Consult with engineers. Time can readily extend to two months if AFEII iterations needed.

1.5.3.5.1.4.3	Verify Outputs	Wed 4/19/06	Wed 5/17/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
Verify ouputs to L1 Muon, L2, L3

Labor BOE-
Run2a CTT experience taking into account all DFEA previously operated in parallel test stand, performed by physicists, performed by physicists. Consult with engineers.

1.5.3.5.2	**L1CTT Installation & Technical Commissioning Complete**	**Wed 5/17/06**	**Wed 5/17/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-The level 1 central track trigger has been technically commissioned.

1.5.3.6	**Level 2 Beta Processors**	**Tue 8/16/05**	**Tue 3/21/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task provides for the installation of the L2 Beta trigger system and its technical commissioning.

1.5.3.6.1	**Level 2 Beta Production Complete**	**Tue 8/16/05**	**Tue 8/16/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone- All parts for upgrade Betas in hand and working.

1.5.3.6.2	**Verify Assembled Processors**	**Tue 8/16/05**	**Tue 11/15/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task verifies processors in L2 trigger or test crates.

1.5.3.6.2.1	Cut Code Release for new Hardware	Tue 8/16/05	Mon 8/29/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes

WBS Definition-
Cut first code release for new hardware. Update any trial code to meet release criteria.

Labor BOE-
Experience w/ original Alpha and Beta processors: 1 physicist full time for 2 weeks.

M&S BOE-
NA

1.5.3.6.2.2	Online Code Support/Development	Tue 8/30/05	Tue 10/18/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	25%	$0.00	$0.00	$0.00	$0.00	70 h	0 h	0 h	0 h	70 h

Notes

WBS Definition-
Tune online code: Develop any enhanced driver features over Run 2a, coordinate these with changes to high level trigger code. Assumes we propogate 2-3 changes at most through the online code.

Labor BOE-
Estimated need for physicist working 50% for duration of task.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Online Code Support/Development" continued

Notes
M&S BOE-
NA

1.5.3.6.2.3	Verify Processor Assemblies -- UVA	Wed 10/19/05	Tue 11/1/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Test assembled processor boards in L2 trigger or test crates. Run through suite of I/O tests in test crate.

Labor BOE-
Experience w/ Run2a Alpha and Beta processors: physicist working 1/2 time

M&S BOE-
NA

1.5.3.6.2.4	Verify Processor Assemblies -- ORS	Wed 11/2/05	Tue 11/15/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Test assembled processor boards in L2 trigger or test crates.

Labor BOE-
Experience w/ Run2a Alpha and Beta processors - run through suite of i/o tests in test crate.

1.5.3.6.3	**Installation And Technical Commissioning**	**Wed 3/1/06**	**Tue 3/21/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
This summary task installs the components of the L2 beta trigger and tests their operation.

1.5.3.6.3.1	Install boards in L2 Trigger	Wed 3/1/06	Tue 3/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Install boards in L2 Trigger Crates.

Labor BOE-
Experience w/ Run2a Alpha and Beta processors: 1 physicist working 1 week.

1.5.3.6.3.2	Technical commissioning-UVA	Wed 3/8/06	Tue 3/21/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	80 h	0 h	0 h	0 h	80 h

Notes
WBS Definition-
Test boards in-situ after installation.

Labor BOE-
Experience w/ Run2a Alpha and Beta processors: 1 physicist for 2 weeks working 1/2 time.

M&S BOE-
NA

1.5.3.6.3.3	Technical commissioning-ORS	Wed 3/8/06	Tue 3/21/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Test boards in-situ after installation.

Labor BOE-
Experience w/ Run2a Alpha and Beta processors: 1physicist working 2 weeks 1/2 time.

M&S BOE-
NA

1.5.3.6.3.4	Technical commissioning-FNAL	Wed 3/8/06	Tue 3/21/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Technical commissioning-FNAL" continued							

Notes
WBS Definition-
Test boards in-situ after installation.

Labor BOE-
Estimated labor (1/4 time physicist) for swapping boards and/or recabling crates during in-situ tests.

1.5.3.6.4	**Level 2 Beta Installed & Technical Commissioning Comple**	**Tue 3/21/06**	**Tue 3/21/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
MIlestone-New Beta processors installed and i/o functions tested in-situ.

1.5.3.7	**L2 Silicon Track Trigger Upgrade**	**Wed 6/15/05**	**Fri 6/23/06**	**$500.00**	**$0.00**	**$4,418.50**	**$4,918.50**

Notes
WBS Definition-
This summary task element includes upgrades to the Run 2a silicon track trigger to adapt it to the increased number of inputs from the Run 2b silicon detector. It consists of the procurement of additional electronics boards of the Run 2a type, together with the development and production of a new board type (the Link Echo Board). Also included are firmware changes, procurement of additional, slightly modified backplanes, and additional cabling and connector hardware.

1.5.3.7.1	**L2 STT Installation**	**Wed 6/15/05**	**Tue 3/7/06**	**$500.00**	**$0.00**	**$4,418.50**	**$4,918.50**

Notes
WBS Definition-
This summary taskcovers installation of the components of the STT.

1.5.3.7.1.1	STT Module Install	Wed 3/1/06	Tue 3/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Install 70 Silicon Trigger Cards: Daughter board that processes raw data from SMT. Design as the same as for Run 2A.

Labor BOE-
Labor provided by physicists: 1 man-week.

M&S BOE-
NA

1.5.3.7.1.2	VTM Install	Wed 3/1/06	Tue 3/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Install 10 VME Transition Modules: 9U board with 4 optical receivers and g-link serial link receivers that receive the raw data sent by SMT. They are used in D0 and CDF as part of the SVX DAQ system.

Labor BOE-
Labor provided by Physicists: 1 man week

M&S BOE-
NA

1.5.3.7.1.3	TFC Module Install	Wed 3/1/06	Tue 3/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	0 h	40 h

Notes
WBS Definition-
Install 8 Track-Fit Trajectory Cards: Daughter board that fits a trajectory to hits in SMT and CFT. Design is the same as for Run 2A.

Labor BOE-
Labor provided by Physicists: 1 man week

M&S BOE-
NA

1.5.3.7.1.4	Splitters Install	Wed 6/15/05	Wed 7/6/05	$500.00	$0.00	$2,798.00	$3,298.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	15 h	25 h
40	SeniorMechTechF	100%	$2,298.00	$0.00	$861.75	$1,436.25	80 h	0 h	0 h	30 h	50 h
48	MandS	1,000	$1,000.00	$0.00	$0.00	$1,000.00	1,000		0	0	1,000
55	Linda Bagby	50%	$0.00	$0.00	$0.00	$0.00	40 h	0 h	0 h	15 h	25 h

Notes
WBS Definition-
Install 13 Passive optical splitters to create data path into STT

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Splitters Install" continued							

Notes

Labor BOE-
Estimate of labor required to make panel bracketry for wall mounting of splitters.

M&S BOE-
Panel on wall -- $500

1.5.3.7.1.5	Fibers Install	Thu 7/7/05	Wed 7/13/05	$0.00	$0.00	$1,620.50	$1,620.50

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	10%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
37	SeniorElecEngF	25%	$471.50	$0.00	$0.00	$471.50	10 h	0 h	0 h	0 h	10 h
40	SeniorMechTechF	100%	$1,149.00	$0.00	$0.00	$1,149.00	40 h	0 h	0 h	0 h	40 h
55	Linda Bagby	10%	$0.00	$0.00	$0.00	$0.00	4 h	0 h	0 h	0 h	4 h
72	John Anderson	25%	$0.00	$0.00	$0.00	$0.00	10 h	0 h	0 h	0 h	10 h

Notes

WBS Definition-
INstall 148 Optical fibers from splitters to VRBs(74) and to STT(74).

Labor BOE-
Estimates based on RunIIa experience: 1 tech and 1 physicist working full time, plus cable czar oversight (25%).

M&S BOE-
NA. (Fibers in Uprade Project STT budget).

1.5.3.7.1.6	**L2 STT Hardware Installed**	**Tue 3/7/06**	**Tue 3/7/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
Milestone-All elements of the silicon track trigger have been installed.

1.5.3.7.2	**L2 STT Technical Commissioning**	**Thu 5/25/06**	**Fri 6/23/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task provides for a full system test: send test data through all modules, verify output, interface with other systems, test downloading and monitoring (likely can use sequencers, 1553, to generate patters (slow burst rate only). Access to CH not needed.

1.5.3.7.2.1	Technical Commissioning, BU effort	Thu 5/25/06	Fri 6/23/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
System test; send test data through all modules, verify output, interface with other systems, test downloading and monitoring (likely can use sequencers, 1553, to generate patters (slow burst rate only). Access to CH not needed.

Labor BOE-
Done by physicists.

M&S BOE-
NA

1.5.3.7.2.2	Technical Commissioning, CU Effort	Thu 5/25/06	Fri 6/23/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
System test. send test data through all modules, verify output, interface with other systems, test downloading and monitoring (likely can use sequencers, 1553, to generate patters (slow burst rate only). Access to CH not needed.

Labor BOE-
Done by physicists.

M&S BOE-
NA

1.5.3.7.2.3	Technical Commissioning, SUNY Effort	Thu 5/25/06	Fri 6/23/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes

WBS Definition-
System test. send test data through all modules, verify output, interface with other systems, test downloading and monitoring (likely can use sequencers, 1553, to generate patters (slow burst rate only). Access to CH not needed.

Labor BOE-
Done by physicists.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.3.7.2.4	**L2 STT Technical Commissioning Complete**	Fri 6/23/06	Fri 6/23/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
Milestone-The technical commissioning of the L2 silicon track trigger is complete.

1.5.4	**Trigger Upgrade Ready for Resumption of Tevatron**	Tue 3/28/06	Tue 3/28/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
Milestone- Run IIb trigger upgrades installed and ready for beam.

1.5.5	**Run IIb Detector Ready for Resumption of Tevatron**	Tue 5/30/06	Tue 5/30/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition
Milestone-Run IIb Detector is ready for the resumption of the Tevtron.

1.5.6	**RunIIb Upgrade Physics Commissioning**	Thu 5/25/06	Wed 8/9/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
This summary task encompasses all physics commissioning of the RunIIb upgrades for physics resumption.

1.5.6.1	**Layer Zero Physics Commissioning**	Thu 5/25/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
This summary task completes physics commissioning of the Layer Zero silicon for RunIIb physics resumption.

1.5.6.1.1	Noise Studies - Univ	Thu 5/25/06	Fri 6/23/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*150%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*240 h*	*0 h*	*0 h*	*0 h*	*240 h*

Notes
WBS Definition-
Analyse noise from L0 silicon

Labor BOE-
Kajfasz

M&S BOE-
NA

1.5.6.1.2	Noise Studies - FNAL	Thu 5/25/06	Fri 6/23/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
11	*PhysicistF*	*200%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*320 h*	*0 h*	*0 h*	*0 h*	*320 h*

Notes
WBS Definition-
Analyse noise from L0 silicon

Labor BOE-
Kajfasz

M&S BOE-
NA

1.5.6.1.3	Timing Studies - Univ	Thu 5/25/06	Fri 6/2/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*100%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*40 h*	*0 h*	*0 h*	*0 h*	*40 h*

Notes
WBS Definition-
Time in L0 Silcon

Labor BOE-
Juste

M&S BOE-
NA

1.5.6.1.4	Timing Studies - FNAL	Thu 5/25/06	Fri 6/2/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*100%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*40 h*	*0 h*	*0 h*	*0 h*	*40 h*

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Timing Studies - FNAL" continued							

Notes
WBS Definition-
Time in L0 Silcon

Labor BOE-
Juste

M&S BOE-
NA

1.5.6.1.5	Alignment - Univ	Fri 6/2/06	Fri 6/30/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes
WBS Definition-
Align L0 silicon

Labor BOE-
Borissov, Lancaster

M&S BOE-
NA

1.5.6.1.6	Alignment - FNAL	Fri 6/2/06	Fri 6/30/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	160 h	0 h	0 h	0 h	160 h

Notes
WBS Definition-
Align L0 silicon

Labor BOE-
Borissov, Lancaster

M&S BOE-
NA

1.5.6.1.7	Clustering Studies - Univ	Fri 6/23/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	240 h	0 h	0 h	0 h	240 h

Notes
WBS Definition-
Perform clustering studies with L0 added to existing silicon

Labor BOE-
Khanov, Kulik

M&S BOE-
NA

1.5.6.1.8	Clustering Studies - FNAL	Fri 6/23/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	240 h	0 h	0 h	0 h	240 h

Notes
WBS Definition-
Perform clustering studies with L0 added to existing silicon

Labor BOE-
Khanov, Kulik

M&S BOE-
NA

1.5.6.1.9	Tracking Studies - Univ	Fri 6/23/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	240 h	0 h	0 h	0 h	240 h

Notes
WBS Definition-
Perform tracking studies adding L0 silicon to existing silicon.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"Tracking Studies - Univ" continued							

Notes

Labor BOE-
Zdrazil

M&S BOE-
NA

1.5.6.1.10 Tracking Studies - FNAL — Fri 6/23/06 — Mon 8/7/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	240 h	0 h	0 h	0 h	240 h

Notes

WBS Definition-
Perform tracking studies adding L0 silicon to existing silicon.

Labor BOE-
Zdrazil

M&S BOE-
NA

1.5.6.1.11 Physics Objects (Vee's, etc) - Univ — Fri 6/23/06 — Mon 8/7/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	100%	$0.00	$0.00	$0.00	$0.00	240 h	0 h	0 h	0 h	240 h

Notes

WBS Definition-
Analyze physics objects having track hits in L0 silicon.

Labor BOE-

M&S BOE-
NA

1.5.6.1.12 Physics Objects (Vee's, etc) - FNAL — Fri 6/23/06 — Mon 8/7/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	240 h	0 h	0 h	0 h	240 h

Notes

WBS Definition-
Analyze physics objects having track hits in L0 silicon.

Labor BOE-

M&S BOE-
NA

1.5.6.1.13 Layer Zero Ready for RunIIb Physics — **Mon 8/7/06** — **Mon 8/7/06** — **$0.00** — **$0.00** — **$0.00** — **$0.00**

Notes

WBS Definition
Milestone- L0 Silicon is ready for RunIIb physics. Note clustering, tracking, physics objects needn't be completed.

1.5.6.2 L1 Cal Trig Physics Commissioning — **Wed 6/7/06** — **Wed 8/9/06** — **$0.00** — **$0.00** — **$0.00** — **$0.00**

Notes

WBS Definition-
This summary task completes physics commissioning of the L1 Cal Trig for RunIIb physics resumption.

1.5.6.2.1 L1 Cal Physics Commissioning - University — Wed 6/7/06 — Wed 8/9/06 — $0.00 — $0.00 — $0.00 — $0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	400%	$0.00	$0.00	$0.00	$0.00	1,440 h	0 h	0 h	0 h	1,440 h

Notes

WBS Definition- Verify physics trigger rates, efficiencies, purities with collider data. Perform noise studies. Make final tuning of ADF coefficients to give correct Trigger Tower response. Make final check of certification of L1 Cal trigger.

M&S BOE-
NA

Labor BOE- RunIIa experience. When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.2.2	L1 Cal Physics Commissioning - Fermilab	Wed 6/7/06	Wed 8/9/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	400%	$0.00	$0.00	$0.00	$0.00	1,440 h	0 h	0 h	0 h	1,440 h

Notes

WBS Definition- Verify physics trigger rates, efficiencies, purities with collider data. Perform noise studies. Make final tuning of ADF coefficients to give correct Trigger Tower response. Make final check of certification of L1 Cal trigger.

Labor BOE- RunIIa experience. When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.2.3	**L1 Cal Trig Ready for RunIIb Physics**	**Wed 8/9/06**	**Wed 8/9/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition
Milestone- L1 Cal Trig is ready for RunIIb physics. Note sliding window studies needn't be completed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.3	**L1 TrackMatch Physics Commissioning**	**Thu 6/8/06**	**Fri 8/4/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task completes physics commissioning of the L1Cal Track match for RunIIb physics resumption.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.3.1	Study L1 Cal Track/Match Triggers In Detail - Univ	Thu 6/8/06	Fri 8/4/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	640 h	0 h	0 h	0 h	640 h

Notes

WBS Definition-
Measure rates, efficiencies, purities (CTM vs L1Cal, CTM vs L1CTT, taus?). Converge on physics CTM terms; iterate algorithms;

Labor BOE-two physicists working full time. When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.3.2	Study L1 Cal Track/Match Triggers In Detail - FNAL	Thu 6/8/06	Fri 8/4/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	320 h	0 h	0 h	0 h	320 h

Notes

WBS Definition-
Measure rates, efficiencies, purities (CTM vs L1Cal, CTM vs L1CTT, taus?). Converge on physics CTM terms; iterate algorithms;

Labor BOE-two physicists working full time. When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.3.3	**L1 Cal Track Match ready for RunIIb Physics**	**Fri 8/4/06**	**Fri 8/4/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition
Milestone- L1 Cal Trig is ready for RunIIb physics. Note sliding window studies needn't be completed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.4	**L1CTT Physics Commissioning**	**Wed 5/31/06**	**Wed 8/2/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task completes physics commissioning of the L1CTT for RunIIb physics resumption.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.4.1	Study L1 Central Track Triggers In Detail - Univ	Wed 5/31/06	Wed 8/2/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	200%	$0.00	$0.00	$0.00	$0.00	720 h	0 h	0 h	0 h	720 h

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost

"Study L1 Central Track Triggers In Detail - Univ" continued

Notes

WBS Definition-
Study L1Central Track Triggers with L1CTT only Triggers in detail.

Labor BOE-When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

1.5.6.4.2	Study L1 Central Track Triggers In Detail - FNAL	Wed 5/31/06	Wed 8/2/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	100%	$0.00	$0.00	$0.00	$0.00	360 h	0 h	0 h	0 h	360 h

Notes

WBS Definition-
Study L1Central Track Triggers with L1CTT only Triggers in detail.

Labor BOE-When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

1.5.6.4.3	**L1 Central Track Trigger ready for RunIIb Physics**	**Wed 8/2/06**	**Wed 8/2/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition
Milestone- L1 Cal Trig is ready for RunIIb physics. Note sliding window studies needn't be completed.

1.5.6.5	**L2 Beta Physics Commissioning**	**Fri 6/23/06**	**Mon 7/31/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition-
This summary task completes physics commissioning of the L2 Beta for RunIIb physics resumption.

1.5.6.5.1	Verify Function of New Features - Univ	Fri 6/23/06	Mon 7/31/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	50%	$0.00	$0.00	$0.00	$0.00	100 h	0 h	0 h	0 h	100 h

Notes

WBS Definition-
Verify function of any new features: trigger bit expansion, etc.

Labor BOE-When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

1.5.6.5.2	Verify Function of New Features - FNAL	Fri 6/23/06	Mon 7/31/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	50%	$0.00	$0.00	$0.00	$0.00	100 h	0 h	0 h	0 h	100 h

Notes

WBS Definition-
Verify function of any new features: trigger bit expansion, etc.

Labor BOE-When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

1.5.6.5.3	**L2 Beta ready for RunIIb Physics**	**Mon 7/31/06**	**Mon 7/31/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes

WBS Definition
Milestone- L1 Cal Trig is ready for RunIIb physics. Note sliding window studies needn't be completed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
"L2 Beta ready for RunIIb Physics" continued							

Notes

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.6	**L2STT Physics Commissioning**	**Fri 6/23/06**	**Mon 7/31/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
This summary task completes physics commissioning of the L2STT for RunIIb physics resumption.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.6.1	Verify STT Track Fitting - Univ	Fri 6/23/06	Mon 7/31/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
12	*PhysicistU*	*150%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*300 h*	*0 h*	*0 h*	*0 h*	*300 h*

Notes
WBS Definition-
Verify function of track fitting code.

Labor BOE-When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.6.2	Verify STT Track Fitting - FNAL	Fri 6/23/06	Mon 7/31/06	$0.00	$0.00	$0.00	$0.00

ID	*Resource Name*	*Units*	*Cost*	*Baseline Cost*	*Act. Cost*	*Rem. Cost*	*Work*	*Ovt. Work*	*Baseline Work*	*Act. Work*	*Rem. Work*
11	*PhysicistF*	*150%*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*300 h*	*0 h*	*0 h*	*0 h*	*300 h*

Notes
WBS Definition-
Verify function of track fitting code.

Labor BOE-When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.6.6.3	**L2 STT ready for RunIIb Physics**	**Mon 7/31/06**	**Mon 7/31/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition
Milestone- L1 Cal Trig is ready for RunIIb physics. Note sliding window studies needn't be completed.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.7	**RunIIb Physics Commissioning Completed**	**Wed 8/9/06**	**Wed 8/9/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition
Milestone-Run IIb Detector is ready for high luminosity data taking with full trigger list.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8	**RunIIb Trigger List**	**Sun 5/15/05**	**Mon 8/7/06**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition-
Develop Trigger List(s) for various expected luminosities.

Labor BOE-
One expert per subsystem.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.1	**Trigsim Tools Certified and Released**	**Sun 5/15/05**	**Sun 5/15/05**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

Notes
WBS Definition
Milestone-Integration of tools for Run IIb trigger upgrade (Trigsimcert, Ratetool) in Trigsim.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.2	**Strawman RunIIb Trigger List**	Mon 6/13/05	Mon 6/13/05	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition-
Milestone - V15 RunIIb Trigger List released

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.3	**V15 Trigger Menu and DataBase Infrastructure**	Thu 9/15/05	Thu 9/15/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	300%	$0.00	$0.00	$0.00	$0.00	0 h	0 h	0 h	0 h	0 h

Notes
WBS Definition
Milestone - First full V15 trigger menu and associated trigger DB infrastructure released

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.4	**V15 Trigger List Parsed by Coor and in DB**	Tue 11/1/05	Tue 11/1/05	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	300%	$0.00	$0.00	$0.00	$0.00	0 h	0 h	0 h	0 h	0 h

Notes
WBS Definition-
Incorporate L3 triggers.

Labor BOE-
One expert per subsystem. When University/Fermilab division of labor known, specific personnel, Universities, will be identified.

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.5	Verify V15 Trigger for High Luminosity - FNAL	Fri 6/23/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
11	PhysicistF	200%	$0.00	$0.00	$0.00	$0.00	480 h	0 h	0 h	0 h	480 h

Notes
WBS Definition-
Verify function of V15 Trigger at increasing luminosity

Labor BOE-

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.6	Verify V15 Trigger for High Luminosity - Univ	Fri 6/23/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

ID	Resource Name	Units	Cost	Baseline Cost	Act. Cost	Rem. Cost	Work	Ovt. Work	Baseline Work	Act. Work	Rem. Work
12	PhysicistU	400%	$0.00	$0.00	$0.00	$0.00	960 h	0 h	0 h	0 h	960 h

Notes
WBS Definition-
Verify function of V15 Trigger at increasing luminosity

Labor BOE-

M&S BOE-
NA

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.8.7	**V15 Trigger Ready for RunIIb Physics**	Mon 8/7/06	Mon 8/7/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition
Milestone- RUnIIb Trigger list is ready for high luminosity running of fully upgraded detector.

WBS	Name	Start	Finish	M&S EQ	M&S Labor	FNAL Labor	Total Cost
1.5.9	**D0 Ready for RunIIb Physics**	Wed 8/9/06	Wed 8/9/06	$0.00	$0.00	$0.00	$0.00

Notes
WBS Definition
Milestone- RUnIIb Upgrade of D0 Detector Complete and High Luminsoity Phyisics data is logging to tape via competent trigger list.